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SEPTEMBER 1920

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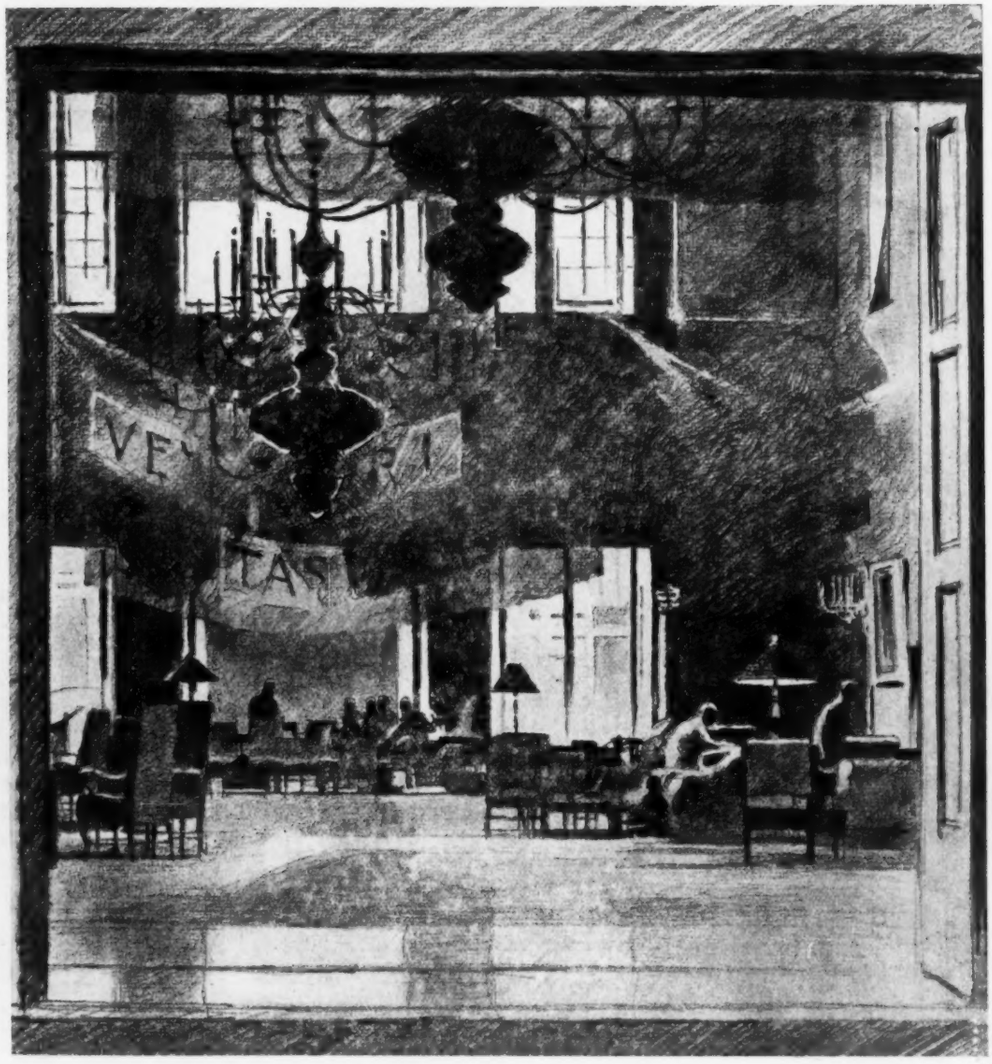


INTERIOR OF HARVARD HALL,
HARVARD CLUB, NEW YORK CITY

From Pencil Drawing by Harold R. Shurtleff

The ARCHITECTURAL FORUM

VOLUME XXXIII SEPTEMBER 1920 NUMBER 3

Interior Woodwork

GENERAL PRINCIPLES WHICH UNDERLIE DEVELOPMENT OF COLONIAL STYLE AND SUGGESTIONS FOR ITS PROPER MODERN USE

By RICHARD B. DERBY

INTERIOR finish in any house is good if it solves the modern problem against a traditional background. It is not good if it is merely modern, and it is not good if it is merely a reproduction of a given prototype. In the one case, though it may be alive, the form in which this life persists is likely to be ugly; in the other case, though the form may be correct in all particulars, life is lacking and the result is a dead thing. When, however, the inside finish is reminiscent of the past and at the same time unmistakably of the present it is almost certain to be both alive and good.

This generalization applies, we believe, to any work in any place, but our emphasis is to be placed on the colonial work native to this country. While this style is coming more and more into use and recognition, it is falling into a kind of disrepute because of its frequent bad handling. The very general use of the style has elevated certain of its characteristics into conspicuous notice. These characteristics are so marked that any casual attention paid to them fixes their general outline in the mind. The result is a wide use of the common characteristics of the style, with little or no attempt on the part of the users to refer these to their source and to become acquainted with them at first hand. Modern work, in reproduction, shows all the defects of this unintelligent procedure.

Most conspicuously abused, perhaps, is the early or Gothic work, so called. In this work we find an integrity of finish which has its roots firmly fixed in an integrity of structure. The frame is a substantial, solid and unified thing; every part of it is a work of art in itself and good to look at by itself, without help from wall covering, inside or outside. And much of the inside of it was not covered but was, indeed, the finish of the completed rooms. Corner posts, ceilings and considerable portions of the interior walls were both frame and finish, yet the essentially inter-dependent relation of the two is almost completely ignored in modern reproductions of this early style. We build our frame, conceal it and then apply a finish which attempts to simulate a structure. The result is a finish which deceives no one and is a merely effeminate brush painting of the masculine rough hewn original. Of course we usually lack the means, today, to build economically in the old way in all its strong integrity; but why debase the style by pasteboard imitations?

Similarly, though not so conspicuously, with the later colonial styles. The broad treatment of the early work is not more refined and effeminized than the refined and delicate treatment of late work is coarsened and vulgarized. The most frequent offenses are found in the size and proportion of openings and in the treatment of fireplace motives. Hardly a new house but has an open plan,— every room visible from every other room, through doorways, frequently doorless, as wide as they are high, sometimes with columns added to support the architrave. Mantels with overmantels abound, both embraced by huge and heavy pilasters. Woodwork generally is used with little or no thought of its proper relation to wall surfaces or of what, indeed, it does in any room. There seems to be a tendency to put as much finish in as the client will pay for, with little thought of appropriateness or character.

The periods too, in the essential meaning of the word, are much confused in modern work. There is little or no value, of course, in period work for its own sake, but underlying the several marked changes through which colonial work has passed are many more fundamental things than dates. Openings, size and position, story height, scale and character of detail, are some of the elements of character which give significance to period divisioning. In sum, we center our attention too much on minor details and depend on these final touches to give our houses a colonial look. And a colonial look is all that many of them have.

This is not an argument for imitation and reproduction, for adherence to period, or for strictly literal following of any part of the style whatever. It is rather a plea for a study of the

style as a whole with a view to building up a background of sufficient scope and correctness to enable designers to use it freely without debasing it. It is not to be hoped or even desired that a literal knowledge of the periods and examples will stick long in the minds of many people, but a thoroughgoing study of these things will leave the memory clear as to the general line of development and will give a sense of character. One will be able to look at a good example of some given type of door or window and know whether it is late or early and the really important thing, what the character of the related detail should properly be.

A certain stigma undoubtedly attaches and should attach to the mere copyist. But this stigma should not attach to those who are merely giving the full value to tradition. There are too many factors at work in the design of a house to permit anybody to believe that the result of their working together can ever be a product true to type. Effort should be made to prove not that an architect has reproduced a given model in a particular piece of work, but rather why he has been able to achieve his good result by way of adapting his models.

It will be found that good work results from the fact that the designer has applied fundamental ideas deduced from a well studied and thorough background. He has not learned his ideas in a school in colonial architecture which would but shortly reduce the style to little more than a mechanical product resulting from mere technical equipment. Individuality in work, therefore, must inevitably result from a particular kind of background personal to each individual and from the method of utilizing this background.

Almost any guiding principle may be adopted as a string on which the individual can thread the results of his study of the development of inside finish. The principle of interest has proved a very excellent guide for certain people and may prove so for others. How are the rooms of a house to be made interesting by means of inside finish? This immediately calls for a study of development under the guiding principle. What are the sources of interest?

The chief source of interest in the early, or seventeenth century, work is undoubtedly the interest which results from the contrast of frame or structure with the filling in between the members of this frame, whether on ceilings or walls. The frame has, of course, an interest in itself. The members are of different sizes. Rough hewn surfaces have the interest of texture which appears in all hand made work. In addition to this, there is also the interest of value in the varied natural colors which time gives to the wood. Given the

Chamber in the Hannah Robinson House, Saunderstown, R. I. Built about 1750

Interior of the Early Type in 17th Century House at Ipswich, Mass.

strong and interesting frame, it became the object of our early builders merely to seal this up,— one room from another and all of the rooms from out of doors. This seal was of two kinds, the flooring and the plaster between the uprights of the walls. The flooring contrasted in texture and, in some degree, in color with the frame itself. The plaster of the walls afforded a great source of interest in its strong contrast with the dark values of all the wood. We have then, as sources of interest in the early work, the use of the hand made heavy frame in contrast with the sawed lumber of floors and ceiling, and with the plaster filling of the walls.

The omission of plaster or rather the covering of the plaster in the later development of the style lost, of course, the interest due to contrast which the exposed plaster gave. There were, however, certain compensations. The development of the panel began with the sheathing of this time. The sheathing was probably first used as a covering of the face of the chimney, and then extended around all the walls of the room. The detail in connection with this is, of course, one of the sources of minor interest, but it is questionable whether these are equal to the loss of the larger interest due to the concealing of plaster.

The beading of this early sheathing became ultimately the deep indentation which resulted in the raised panel. This indentation, at first merely applied vertically, extended at last all the way around the panel. Simultaneously with this development of the panel came the casing of corner posts and beams, and the plastering of the ceiling between the larger beams. This resulted in a loss of the interest due to texture and this loss was compensated for by the use of paint. Paint afforded opportunities for new kinds of value and color contrasts in their relations to the plaster walls.

From this period on the interest due to finish is to be followed from a somewhat different angle. The woodwork is now white and its interest, aside from the interest of detail, becomes a matter of achieving variety, chiefly in the masses. We do not discover variety in the great amount of finish used as clearly as we do in a proper disposition of whatever amount is used. Some rooms are finished throughout in wood and yet are exceedingly monotonous. Variety is most easily achieved by avoiding balance within the limits of the wood finish itself. The unfinished parts of the walls of a room to which finish is applied should be employed, equally with the woodwork, to create the necessary balance in the room as a whole. Study of the old work of this period will show the way to do this. The single wood end in contrast with the three plaster walls, or in contrast with plaster walls plus dado, is the conspicuous treatment; and it is a treatment at once fundamental and capable of wide variation in handling.

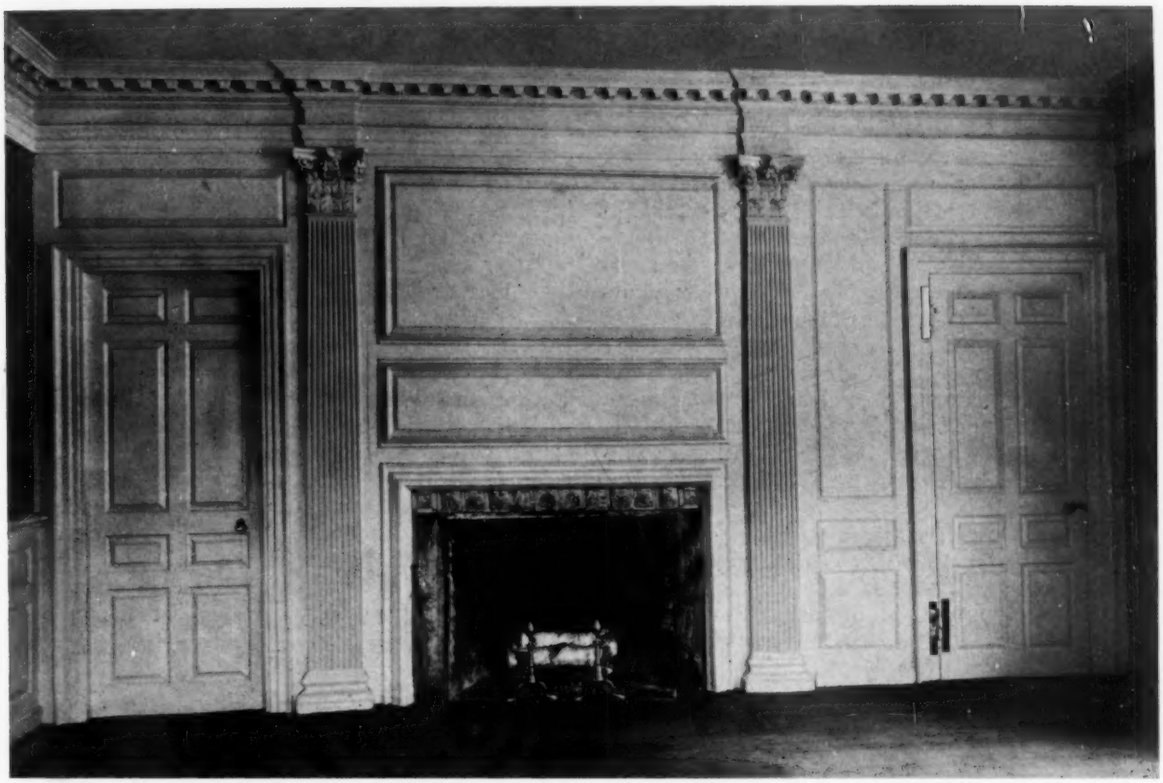
The interest of the middle period work is the

Modern Hallway. Designed by Derby & Robinson

interest which attaches to transitional development. From this point of view, at any rate, the period begins with the casing of the beams and the plastering of the ceiling. All the older methods and ideas are clearly discernible beneath the white painted veneer. The chimney becomes smaller, the fireplace alcove becomes a mere recess in the wall and then disappears entirely. The door leading to the entry takes to itself panels and is duplicated on the other side of the fireplace. The dado comes in, divided up by its horizontal panels. The paneled wall is added above the dado. Architectural forms, part by part, are added and finally the colonial which is called, or miscalled, Georgian emerges into full view. Though the middle work may lack the commonly central interest of the other periods, it nevertheless has a series of minor interests which more than compensate. Furthermore, it has furnished most of those commonly known characteristics by which the style is known and to which, in the minds of many people, it is unfortunately limited.

The work of 1800 represents the highest development in the design of inside finish which the country affords. It is in widest contrast with the early or Gothic work. This, and its development, was of what might be called the casual type. Its interest lies to a considerable extent in this very characteristic of casualness. Though fundamental, it may almost be said to have happened. The 1800 work, on the other hand, is the result of study. In 1800 work nothing ever

Room in the Fowler House, Danversport, Mass. Built in 1805



DETAIL FROM JEREMIAH LEE HOUSE, MARBLEHEAD, MASS. BUILT IN 1768

EXAMPLE OF DETAIL IN A RECENT HOUSE AT CONCORD, MASS.
FROHMAN, ROBB & LITTLE, ARCHITECTS

merely happens. In the best examples of it everything belongs, nothing is missing, the result is perfect. It has the interest, therefore, which attaches to any fine work of a sophisticated order. Rules were developed for the proportion of part to part and a knowledge of these rules was taken for granted among the best designers. One of the best results of these rules of proportion is found in the establishing of scale which they accomplished. Having worked out a satisfying relation between the parts they were then able to apply this relation in its integrity to each particular case. If the size of an architrave was five inches for an opening of one size, it became so much larger or smaller for a larger or a smaller opening. This, clearly, was taking a leaf from the book of the perfect Greeks. The study of 1800 work, therefore, leads in itself to an education in colonial work at its highest stage of development.

With a study of the major sources of interest it is well to combine a study of the minor sources also. The superficial characteristics of colonial work are easily noted and are reproduced without difficulty, and they have gotten so into the air that even a layman can recognize them. But results after this pattern, though they may have a kind of vulgarized character, are always bad and are really more reprehensible than work which does not even attempt to achieve a particular style. Knowledge of detail will tend to correct the designing of bad work and a study of detail, by way of the kinds of interests involved, will build up the necessary background of knowledge.

Study of inside finish is not to be confined to the three principal epochs of our native architectural development. There are, of course, the sectional variations of the periods themselves, as Southern work, Northern work, and the work of the middle states. In addition, there are the local variations within each of the larger sections. Covering the entire field means a great deal of study, much more than most practising architects are likely to give to colonial work; but a thorough examination of however limited a part of the field will develop in the student a respect for the style and skill in his use of it which will go far toward correcting the vicious and apparently growing tendency to vulgarize it.

Detail of Parlor in the Hannah Robinson House, Saunderstown, R. I. Built about the Middle of the 18th Century

Building Foundations

PART I

By J. R. WORCESTER

THE chief function of building foundations is to transfer the weight of the building to the ground, thereby securing a safe, permanent and immovable support for the structure. Secondary results are often obtained, by use of foundations, such as retaining surrounding ground at a level higher than the basement floor, but these should not be confounded with the principal use. It is evident that to properly design foundations one of the first necessities is to calculate the load coming upon the different parts. This requirement produces the sometimes embarrassing situation that while the foundation must be constructed before the rest of the building, it cannot be properly designed until the plans are far advanced and approximate loads ascertained.

Consideration of Loads

By far the most important part of the load is the weight of the building itself, or the "dead" load as it is commonly called. This is always present and active, and the effect on the soil is much greater from a constant force than from a load suddenly applied and soon removed. There is an advantage in this circumstance in the fact that the dead load can be accurately computed, while the "live" load is always problematical and a matter of assumption. The lesser effect of the live load is recognized in most building regulations by the provision that a decrease in the assumed live load is permitted in parts supporting large areas and several stories.

In computing the loads on foundations it is necessary to know in a general way how the floors are to be framed, for not only is the weight of the floor itself dependent upon the framing, but the direction of beams and girders will determine which walls and piers are bearing walls, and which carry little or no floor loads.

It is desirable in calculating loads to keep the dead and the live separate throughout. This enables one to apply the proper reduction to the live load as a whole, and it is generally a simpler way to do it. The live load on foundations may usually be obtained with sufficient accuracy by multiplying the floor area contributory to a wall or column by the number of floors and the unit load, without following out the reactions from individual beams and girders.

Thus far we have been considering only the vertical force due to gravity. There are also certain conditions under which horizontal forces must be taken into account. The horizontal force of the wind need be considered, as affecting foundations, only in rare instances. In the case of a tower, a tall isolated chimney, or a wall standing by itself, the wind pressure may cause an appreciable increase in the load on the foundation in the leeward side, but in buildings of common proportions this increase may be ignored.

The horizontal force of earth against a retaining wall is a real factor which often affects the design. This force is not always disadvantageous, as it tends to resist the "tipping" effect of a load on an eccentric base, and thereby may relieve what would be an excessive load on the soil. The subject of lateral earth pressures is too large to be considered within the limits of the present article.

Supporting Power of Ground

Having ascertained the vertical loads which are to be transferred by the foundations to the soil, the next step is to determine the power of resistance of the material upon which they will rest. This may vary all the way from zero to infinity or, more truly, from so small a value as to be unfit for carrying any structure, to a value greater than that of any form of building material that could be used for a foundation. At the lower end of the scale are loam, peat and mud; at the other extreme is solid ledge. Between these lie innumerable gradations.

A knowledge of the geology of the location is of great assistance in a determination of the strength of the underlying material, and with such knowledge, test pits to the level of the natural bottom of the foundations, and sounding with a bar below this grade will usually furnish the necessary data. Where the geological formation is unknown, and where there is a possibility of there being soft material below, the safe course is to obtain borings in several parts of the location, carried low enough to establish the general character of the ground. In sand, silt or clay, borings can be made with an auger; but where miscellaneous materials are encountered the simplest method is by the "wash boring" process. This in the hands of experienced men gives very reliable results.

After obtaining information as to the nature of the soil at different levels a decision must be made as to the stratum upon which to depend for support, and the carrying capacity of this stratum. Soils which have been deposited through water are

usually found to be stratified in layers approximately level. These layers, varying in the coarseness of their particles, differ as to their carrying capacity, and it is often possible to take advantage of this condition by applying the foundation to the top of a hard stratum, or crust, which will help to distribute it over a greater area of soft material below the crust. A few general rules as to choice of soil may be of service.

1 — Filled ground is unreliable, and permanent structures should not be placed on filling. The reasons for this are two: first, because the filling material is generally poor and full of voids, allowing it to compress and contract for many years; and second, because in most cases the filling has been dumped upon what was top soil, containing organic matter,— mud, peat or loam. This rule, though general and always safe, may be unnecessarily severe in exceptional cases. Where a sand or gravel fill has been in position long enough to have become thoroughly consolidated, and where the original surface was not soft, the objection to resting directly upon the fill may be so slight as to be negligible.

2 — Soil containing organic matter is compressible, and will contract as the organic material decomposes. It is therefore unsuitable as a support for a permanent structure. This rule, too, is to be applied with discretion, for the proportion of organic matter varies all the way from 0 to 100 per cent. Alluvial soil contains more or less organic matter and where this extends to great depth it may be necessary to depend upon it. On the other hand, where clay, sand, gravel or rock are within reach of the surface, and are overlaid with silt, peat, mud or loam, it is distinctly worth while to penetrate to the organic part of the soil.

3 — A soil which has very slight carrying capacity, when free to flow, may be entirely satisfactory as a supporting medium when confined. It is important, with material of this character, to distribute the weight of the structure so that as far as possible the load per square foot will not differ greatly in different parts of the building. Two examples of the effect of unequal distribution are well known in Boston. The New Old South Church on Boylston street has settled more at the corner where the tower is than elsewhere, causing the inclination of the tower. The Public Library is loaded much more heavily in the rear, where the book stacks are located, and the rear has settled more than the front. Both of these buildings are carried by piles down to a crust of sand and gravel which, in turn, is supported upon a deep bed of very soft clay.

For the foundations of important structures in questionable localities it is worth while to test the bearing value of the soil. To be of service this testing must be done with care and judgment, particularly if the soil is plastic and likely to flow if not confined. A good way is to excavate a pit to a depth within a foot or so of the level at which the soil is to be tested. This pit should be large enough to allow a man to work comfortably at the bottom. A small excavation should then be made in the center which, at the bottom, will be just the size of the loading plunger, and be leveled off at the required grade. The testing plunger may be a square stick say 12 by 12 inches and long enough to reach to the surface, where it may be fitted with a platform to carry the load. The platform may be stayed in position by boards, laid horizontally, extending out in two directions and attached to stakes driven into the ground. The best way to observe the settlement is by means of a surveyor's level sighting on a rod fixed in the top of the plunger.

The most careful tests should be accepted with reservations. One should remember that, on the one hand, a long time test might show a different result from a short time experiment while, on the other hand, a load applied to a single square foot is more liable to cause a settlement in many soils than if the same pressure per square foot were applied to a larger area at the same time.

It is unsatisfactory to attempt to formulate definite rules for safe bearing pressures because of the difficulty of describing soil conditions so that they will be recognized with certainty. For instance, "soft" clay means very different consistencies to different persons. To describe it as "putty like" does not help much, for putty, as we all know, may vary in softness quite as much as clay. The same is true with sand and other materials. Building laws of different cities prescribe loads for "firm, coarse sand" all the way from one and three-quarters to ten tons per square foot. A few suggestions may help in deciding upon a safe load in some cases.

Clay in its natural position, when below permanent ground water level, may be so soft that a shovel or a bar can be pushed into it without much exertion. In this condition, unless the soil is confined so that it cannot flow laterally, it has very little supporting power. On the other hand, if it is confined by a stratum of harder material over it, with no chance of deeper excavations nearby, it will carry a considerable load, or say two tons per square foot. The clay itself is practically incompressible and is inferior in supporting power only through its flowing quality. As the percentage of water contained in the clay decreases, its consistency becomes harder. A very common consistency is that in which a shovel can be inserted with difficulty, and a bar can be forced down only a little way at a time. Three and one-half or four tons per square foot is not likely to overload the clay in this condition, and there is not much chance of its flowing laterally. Where moisture is still less, clay may be found in all degrees of hardness up to a condition of shale, on which ten tons per square foot would be perfectly safe, and intermediate degrees of hardness would warrant intermediate loads.

Sprinkler Installation for Fire Protection

PART III — RULES FOR SIZING PIPE

By W. D. BROWN, C.E.

WHEN a large floor area is divided by a fire wall, a fire starting on one side of the wall will be controlled by automatic sprinklers before it can spread to the opposite side of the wall. Under these conditions, the floor becomes two small areas in place of one large area and pipe sizes are reduced accordingly.

Note: A fire wall is a term applied to a brick, concrete or other non-combustible wall, with a parapet above the roof and all openings equipped with fire doors on both sides of wall, one of which must be self-closing.

In buildings where top flooring is thoroughly tight and all floor or wall openings on one floor are protected to prevent drafts communicating to any other floor, a fire will be controlled by sprinklers before it spreads to any other floor. Under these conditions each floor becomes a separate fire area.

Where extraordinary conditions exist and where there is likelihood of a fire passing through unprotected openings, pipe sizes should be increased accordingly. For example, in areas such as stair towers where a fire starting at the lower landings might spread rapidly above or generate sufficient heat to open sprinklers under upper landings, the entire area should be considered as one fire area and pipe sizes kept large enough to supply all the sprinklers in this enclosure.

LOCATION OF SPRINKLERS — Sprinklers should generally be located in an upright position. When construction or occupancy of a room or enclosure makes it preferable, permission may be given, except on a dry pipe system, to locate sprinklers in a pendant position.

For example, in the first story of a department store pipes are usually concealed above the plaster ceiling and sprinklers only exposed below, a small rosette or moulding placed above the sprinkler improving its appearance.

It will be seen that this takes an extra piece of pipe extending through the plaster, and two extra joints for each sprinkler. For this reason extra care must be taken with this type of installation.

Concealed sprinkler installation costs approximately 25 per cent more than exposed work, and is prohibited except where absolutely necessary.

Concealed piping should be painted two coats of good protective paint, one before and one after installation. The pipes may be placed in ducts or thoroughly enclosed in cement but in no case should they form a part of the reinforcement.

Sprinkler deflectors should be parallel to ceilings, roofs or the inclines of stairs, except when installed in the peak of a pitched roof when they should be horizontal.

Distance to the top of the deflectors from the ceiling of mill or other smooth construction, or from the bottom of joist construction, should not be less than 3 inches nor more than 10 inches; 5 to 8 inches is the best distance. With the average type of sprinklers the minimum and maximum distance from sprayed surface to center of pipe would be 7 and 14 inches.

In the case of fire-resistive building, the distance between deflectors and ceiling may be increased where conditions warrant, as, for example, under a paneled ceiling and in semi-mill or unusual construction where it is necessary to keep sprinklers below beams, or where, as in the case of a fireproof building, the object is to protect the combustibles rather than the building material.

Sprinklers should be placed everywhere throughout the premises, including basements and lofts, under stairs, inside elevator wells, in belt, cable, pipe, gear and pulley boxes, inside small enclosures, such as drying and heating boxes, tenter and dry room enclosures, chutes, conveyor trunks and all cupboards and closets unless their tops are entirely open, or arranged so that sprinklers can properly spray therein.

Special instructions should be obtained from the inspection department having jurisdiction relative to placing sprinklers inside of show windows, telephone booths, boxed machinery, metal air ducts, ventilators, concealed spaces, and under large shelves, benches, tables, overhead storage racks, platform and similar water sheds, and over electrical generating and transforming apparatus and switchboards.

Note: Paper or similar light, inflammable covering is sometimes used over clothes and stock closets, and in case of fire is quickly burned away allowing the water from sprinklers a clear passage.

Experience teaches that sprinklers are often necessary where seemingly least needed. Their protection is required not alone where a fire may begin, but also wherever any fire might extend, including wet or damp locations.

Sprinklers are omitted by most insurance inspectors, in fireproof stair towers when isolated from main buildings. Sprinklers installed in such areas are at the tops of the towers which must be protected. Some inspectors require one sprinkler under the first landing in the basement of a fireproof stair tower when this space might be used for storage.

Sprinklers cannot be expected to keep out fire originating in unsprinklered territory and stringent measures should be used to properly cut off all unsprinklered portions of a building or exposures.

When a building fully equipped with sprinklers

communicates with another not so equipped, the opening must be protected by standard fire doors on both sides of the walls, one of which must be self-closing.

The danger of sprinkler protection being impaired by exposure fires should be reduced by providing shutters, wired glass or open sprinkler protection at exposed openings.

RISERS — There should be one or more separate risers in each building and each section of the building divided by fire walls. Each riser should be of sufficient size to supply all the sprinklers connected with it for any one fire area, as determined by the general schedule of pipe sizes. In case of riser pipes passing through cinder concrete, a sleeve or some other suitable device should be provided to prevent corrosion.

Risers should be located as near the center of a building as possible.

VALVES — Each water supply should be provided with a gate valve located where readily accessible. Gate valves in supply pipes to automatic sprinklers should be secured open by devices such as padlocks or riveted leather straps. A check valve should be installed on each source of water supply. Its purpose is to prevent water from one source of supply entering into some secondary source, and also to prevent the water in the sprinkler system from returning to the city main. A check valve is constructed with a clapper which allows water to flow in but one direction.

FITTINGS — Both from the standpoint of appearance and efficiency a one-piece reducing fitting of good design should be used wherever a change is made in sizes of pipe. Bushings and couplings should not be used except where unavoidable.

Long turn fittings should be used on risers and supplies to cross mains for 2½-inch and larger pipes to reduce loss of pressure due to friction.

HANGERS — Sprinkler pipes, with few exceptions, are hung or suspended from the ceiling by wrought or cast iron hangers. Hangers should be of adjustable pattern so as to allow all sprinkler pipes and fittings to thoroughly drain. Pipes should pitch ¼ inch in 10 feet on wet system and ½ inch in 10 feet in the dry system.

Fig. 5 is a view of an adjustable hanger used quite extensively. "A" is the foot piece hung to the ceiling by screws, "B" is the rod with a long thread for adjusting and "C" is the ring for the pipe.

LOCATION OF HANGERS — The ¾-inch pipe at the ends of all branch lines when over 6 feet in length should have two hangers and other lengths of pipe on branch lines should have one hanger each, located not less than 12 inches or more than 18 inches from sprinklers as shown in Fig. 6.

The first piece of pipe from a feed main on a branch line, when 1½ inches and smaller and 8 feet or more in length, should have a hanger which may be placed about 2½ or 3 feet from the cross main. When less than 8 feet no hanger is required except that in the end bays a hanger would take up whatever sag there may be in the main pipe, from the last beam to stringer line.

Each length of feed main pipe should have a hanger located at approximately half the distance between stringer lines. Pipes connecting riser to feed main and all random pipes should be equipped with hangers spaced not more than 10 feet on centers.

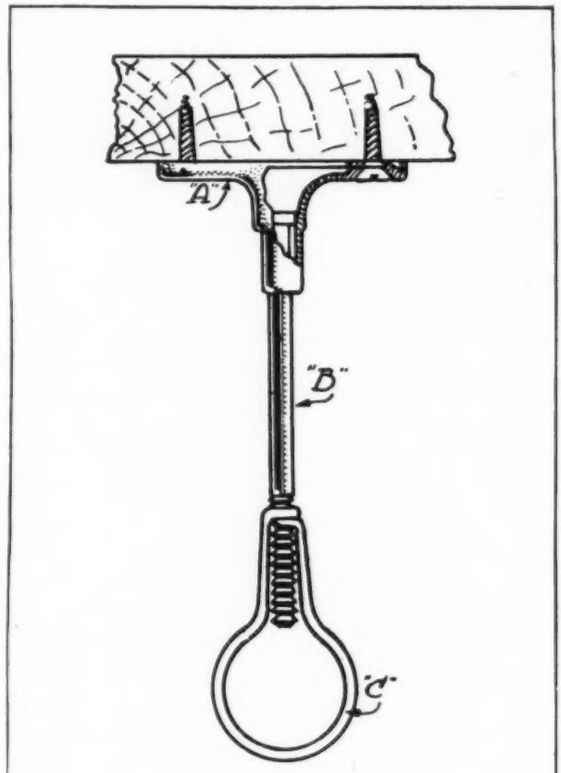


Fig. 5

When setting inserts, as in the case of a concrete building, it is recommended that sprinkler lines be located in the center of the bay. This arrangement permits even distribution of water to all portions of the bay, and in some cases reduces the required number of sprinklers. For example, in the case of a sprinkler covering its maximum allowed area with line in center of the bay, a line off center would increase the distance from line to edge of bay which would necessitate additional sprinklers.

ALARM VALVES — There should be one or more valves located in each building and each section of a building divided by fire walls. This valve should be so arranged that an alarm will be given when the opening of a sprinkler causes a flow of water through riser and valve. In general, an alarm valve is a check valve with a weighted clapper installed in the riser. Under normal conditions the pressure throughout the sprinkler system will be the same as that on the supply side

of the alarm valve, the weight of the clapper keeping it closed.

In case a sprinkler head opens, the pressure on the system side of the check valve is immediately relieved and the continued pressure on the supply side will open the clapper of the valve. The opening of the clapper in an alarm valve permits a flow of water through a small pipe which operates a mechanical gong on the outside of the building. At the same time an electric device, regulated by the flow of water or action of a clapper, operates a gong, which is usually located in the watchman's headquarters.

DRY PIPE VALVES — Buildings that have no heating facilities or such portions of a building where water in sprinkler pipes would be apt to freeze, should be equipped with a so-called "dry pipe" system.

The piping in the area exposed to freezing temperature is filled with compressed air and between the air-filled pipes and the water supply is located a dry valve, that is, a valve in which air pressure on one side balances the water pressure on the other side. When a sprinkler opens, the air escapes and the pressure of water opens the dry pipe valve which admits water to the sprinkler system. The water flowing through a dry pipe valve operates the mechanical gong and electric bell.

A dry pipe system is only used where it is inadvisable to install a wet pipe system, as the interval between the opening of the sprinkler and the arrival of water at the seat of the fire might allow the flames a start which would open up more sprinklers than necessary and cause an increased water damage. The air capacity of a system depends upon the number of sprinklers controlled by the dry pipe valve. This number should not exceed 300, and 400 should be the maximum allowed. The reason for this is that the greater the volume of air in the system, the longer it will be before water is released.

Dry pipe systems should be so designed as to eliminate long runs of pipes between dry pipe valves and sprinkler feed mains, as each gallon capacity of such pipes is equivalent to one extra sprinkler.

Where more than the number of sprinklers allowed on one dry valve are necessary and two or more valves are installed in a building containing two or more floors, the system preferably should be divided horizontally by consecutive floors. With this arrangement sprinklers opening on one floor would operate but one valve and the alarm would indicate location of operating sprinklers.

The dry pipe valve should be located in a warm room, or in a frost proof valve closet, well lighted. Space of at least 2 feet 6 inches should be allowed on all sides of the valve.

Electric, steam, hand and belt driven air compressors are used to maintain air pressure on the system. The supply for an air compressor should be taken from a location where the least possible amount of moisture will enter the system. The loss of air pressure on the average system requires additional pumping about once a month.

FIRE DEPARTMENT CONNECTIONS — Very often the underwriters require a brass Siamese connection located on the outside of a building and fitted with couplings threaded to the same standard as used by the local fire department. The purpose of these connections is to allow the public fire department steamers to increase water pressure in sprinkler systems and standpipes. Each connection, when used for sprinklers, must be marked in raised letters, one inch high or larger, "Auto Sprinklers."

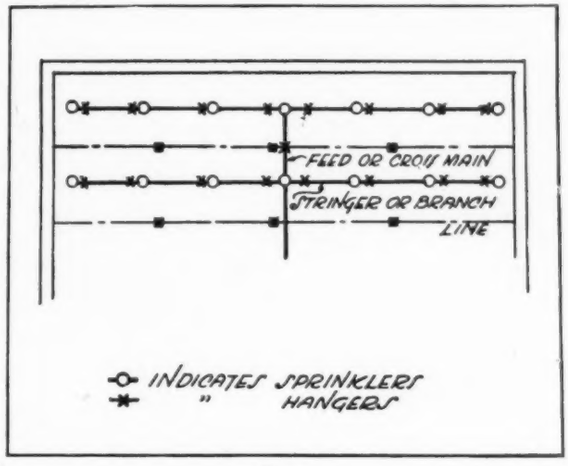


Fig. 6

TESTS — The tops of all wet pipe sprinkler risers should have a ¾-inch pipe connection equipped with a control valve and so arranged that water will discharge through a ½-inch brass outlet. The flowing of water through such an outlet is equivalent to water flowing through a sprinkler and should operate alarms and it also indicates to the inspector that the water has an unobstructed passage throughout the system.

On the dry pipe system a small pipe is connected on the water side of the dry pipe valve and so arranged that the opening of a valve allows the water to operate the mechanical gong and electric bell for testing.

At alarm and dry pipe valves the main drain pipe for an entire system should be connected to some sufficient outlet so as to allow the opening of the drain valve and the full flow of water without overflowing any service connection. This drain pipe should be not less than 2 inches in size. With the full flow of water in this pipe the reading on the pressure gauge will give the reduction in pressure equivalent to the opening of sprinklers caused by an average fire.

TESTS AFTER INSTALLATION — All wet pipe systems should be tested to at least 150 pounds pressure and be subject to this pressure for two hours. If normal pressure exceeds 100 pounds this test should be made with 50 pounds above normal.

A dry pipe system should be tested to an air pressure of at least 40 pounds, and all leaks stopped so that the system will not allow a greater pressure loss than 1½ pounds in twenty-four hours.

PRESSURE GAUGES — Pressure gauges of standard make and a 4½-inch dial should be installed on all water supplies. In each sprinkler system one pressure gauge should be located below the alarm valve and one above the alarm valve, also one "water" pressure gauge should be located on the supply side of a dry pipe valve and one "air" pressure gauge on the system side of the dry pipe valve.

HAND HOSE CONNECTIONS — Small hand hose connections are valuable for extinguishing small fires under decks, tables, etc., when discovered and before sprinklers operate. These hose connections are attached to sprinkler piping under certain restrictions. Connection to a sprinkler system should be through 1-inch pipe and not connected to any sprinkler pipe smaller than 2½ inches. Hose should be 1½ or 1¾ inches in diameter and of unlined linen. Nozzle should not be larger than ½ inch.

OPEN SPRINKLERS — Open sprinklers have proved a great help in protecting windows, cornices and portions of frame structures from fires near by. Although satisfactory in forming water curtains they are not sufficient protection to be used in preference to fire shutters. In conjunction with them, however, a barrier is produced that fire can scarcely cross. They have deflectors similar to those of automatic sprinklers but have no struts or braces.

Unlike the automatic sprinkler open sprinklers depend upon the human element for proper functioning. Supplies to the open sprinkler are controlled by a valve which is normally kept closed and is manually operated when water is required in the system. Supply for open sprinklers should be a city connection rather than a tank or any exhaustible supply. At the top of a riser pipe a pipe should be connected inside of a building and an outlet left for pressure gauge.

SIZES OF ORIFICES FOR WINDOW SPRINKLERS —

	2 *Stories*	3 *Stories*	4 *Stories*	5 *Stories*	6 *Stories*
Top line	3/8 in.	3/8 in.	3/8 in.	3/8 in.	3/8 in.
Next lower	5/16 in.	5/16 in.	3/8 in.	3/8 in.	3/8 in.
Next lower		1/4 in.	5/16 in.	5/16 in.	5/16 in.
Next lower			1/4 in.	5/16 in.	5/16 in.
Next lower				1/4 in.	1/4 in.
Next lower					1/4 in.

Where there are over six horizontal lines of windows it may be preferable to omit sprinklers on the first and possibly on the second stories.

PIPE SIZES — Branch lines should not have more than six sprinklers.

Branch lines — Sizing

3/8 in. orifice one head 3/4 in. pipe, two heads 1 in. pipe, four heads 1¼ in. pipe, six heads 1½ in. pipe.

5/16 in. orifice one head 3/4 in. pipe, three heads 1 in. pipe, six heads 1¼ in. pipe.

1/4 in. orifice one head 3/4 in. pipe, five heads 1 in. pipe, six heads 1¼ in. pipe.

SIZES FOR RISERS AND FEED MAINS —

1½ inch pipe not over 6 heads.
2 inch pipe not over 10 heads.
2½ inch pipe not over 20 heads.
3 inch pipe not over 36 heads.
3½ inch pipe not over 55 heads.
4 inch pipe not over 72 heads.

Where the supply pipe to a branch line is over 25 feet in length, these pipes should be at least one size larger than the table requires. At all dead ends a 6-inch nipple and brass plug should be installed for blowing out any foreign substance. All pipes, back to cast iron pipe and also all exposed material should be galvanized. Arrangements should be made to drain pipes back to control valve.

LOCATION OF OPEN SPRINKLERS — For windows not exceeding 5 feet wide one sprinkler should be placed at the center, near the top. Where windows are over 5 feet wide, or where mullions interfere, two or more sprinklers should be used. In some cases one sprinkler has been installed in a window 6 feet wide by special permission from the inspection department having jurisdiction as constituting an exceptional case.

CORNICE, SIDE WALL OR RIDGE POLE SPRINKLERS — On frame buildings, mansard roofs, etc., pipe sizes and arrangements should be the same as for window sprinklers, excepting that where water supplies admit, the inspection department having jurisdiction may revise this schedule. Sprinkler heads should be spaced so as not to exceed 8 feet on centers.

UNDERGROUND PIPING — Cast iron, bell and spigot pipe should conform to the standard approved by the inspection department having jurisdiction. This pipe is made in 12-foot lengths and fitted with a bell outlet on one end and a spigot on the opposite end.

Joints are made with lead and packing. The connection between bell and spigot pipe and inside screw pipe should be made with a flange spigot casting, the spigot joint made outside of the building and flange connection located inside of the building. This arrangement eliminates all lead joints inside. Underground pipes should be buried to a depth of at least 1 foot below lowest frost line to top of pipe. This distance varies from 2½ feet in Southern states to 10 feet in the Northern part of Canada.

Hydrants and hydrant houses should conform to requirement issue by the inspection department having jurisdiction. Indicator post valves controlling sprinklers should be located at least 40 feet away from a building, and the name of the building and the service it controls should be plainly stenciled on the valves.

A House in the Southern Colonial Style

RESIDENCE OF THE HON. LATHROP BROWN, ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

THERE is always something of particular interest in a house that is directly inspired by some great and well known prototype which has had an important influence on the history — social or architectural — of the country. It is not necessary that the house be a copy, an exact reproduction of the original, for an added interest exists when it differs in many respects from the prototype or when the original is followed in only a general way.

This interest is found, to a very marked degree, in a country house near Stony Brook, Long Island, the home of the Hon. Lathrop Brown, designed and built under the direction of his architects, Messrs. Peabody, Wilson & Brown of New York. This very successful house is obviously inspired by Westover, but there has been no effort to make the newer house a copy of the old which would have been impossible since the Long Island house is very much the larger and the life lived on Long Island in the twentieth century differs in many respects from that which obtained in Virginia in the eighteenth.

The Brown house stands in a small valley facing Stony Brook Harbor and about 200 feet from the beach. Like its Virginia prototype this house has two façades, that which faces the water and another front which faces what will later on become a very stately garden.

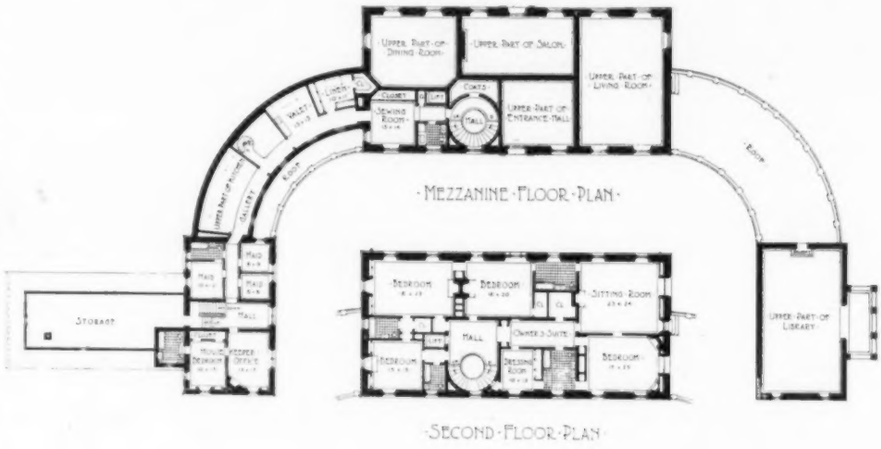
Seen from either side the house presents an appearance of a broadly planned mass of buildings which with their "informal formality" go far toward carrying out the atmosphere of an old estate in Virginia. The rich and unusual color and texture of the walls, the low, square chimneys and the widely extended service buildings contribute largely to the appearance of comfort and hospitality which is so well expressed. Upon the garden side the planting adds a more intimate note and the balanced arrangement of the buildings carries out the feeling of complete and well ordered spaciousness which is indicated by the water front.

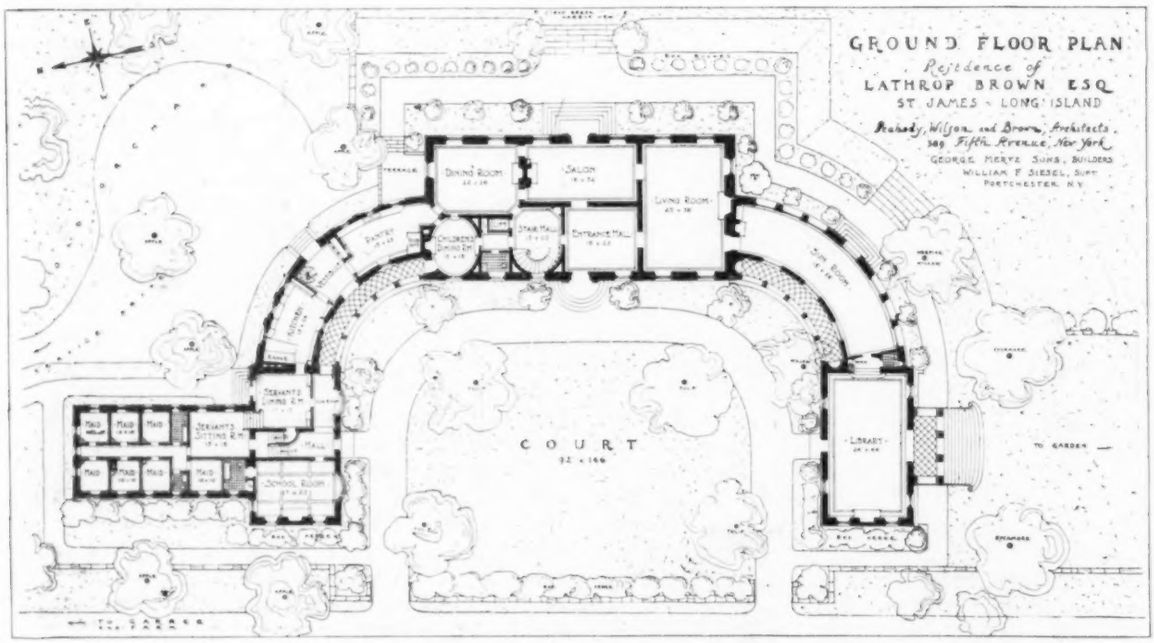
Connected with the main structure by covered, curving passageways are two minor or accessory buildings, as at Mt. Vernon, placed to allow the broad sides to face south, insuring maximum sunshine. The walls of the house are of brick transported from Virginia where they were roughly moulded by negro laborers and burnt with hickory; the bricks are somewhat larger than those ordina-

rily used to-day, and are of a strong orange-pink color and were wire brushed to obtain more texture and brilliancy of color. The yellow lime joints are rather small. Against this strong background are columns and other details about the entrance door of Petros bleaching limestone such as is used for St. Thomas' Church, New York. The slates of the roof were taken from an abandoned quarry in Virginia; cornices and window frames are of cypress which has had the soft grain removed by the use of a torch and wire brush which gives a mellowed, antique effect.

In floor plan the Long Island house follows to a great extent that of certain great Virginia country houses and in many of these earlier homes the stairs are not set in the entrance hall but are placed elsewhere. In this instance they make two turns to the second floor, and at the first landing give access to the service passage which extends over the kitchen and pantry. This plan has several advantages; it prevents the kitchen and pantry from being used as a passageway, yet they both have windows east and west; it obviates the necessity of rear stairs and, most important of all, it makes unnecessary a rear hall on the second floor, which allows the northeast and northwest bedrooms to be intercommunicating and, therefore, cooler in summer. The only general hall space on the second and third floors, though the main building is 94 feet long, is the stair landing, as in Westover and in several of the Annapolis houses.

The children's oval dining room, with a ceiling of 8 feet 6 inches, serves as a pleasant contrast to the large, high ceiled dining room and allows for a sewing room and toilet on the mezzanine. This is used for a women's dressing room in times of entertaining and obviates the necessity of having two sets of coat rooms and toilets on the ground floor. The guest room walls on the third floor have been furred out to hide the slanting roof, and to allow of a more formal decorative treatment of the rooms. A possible sleeping porch has been





Ground Layout Showing Orientation of Group

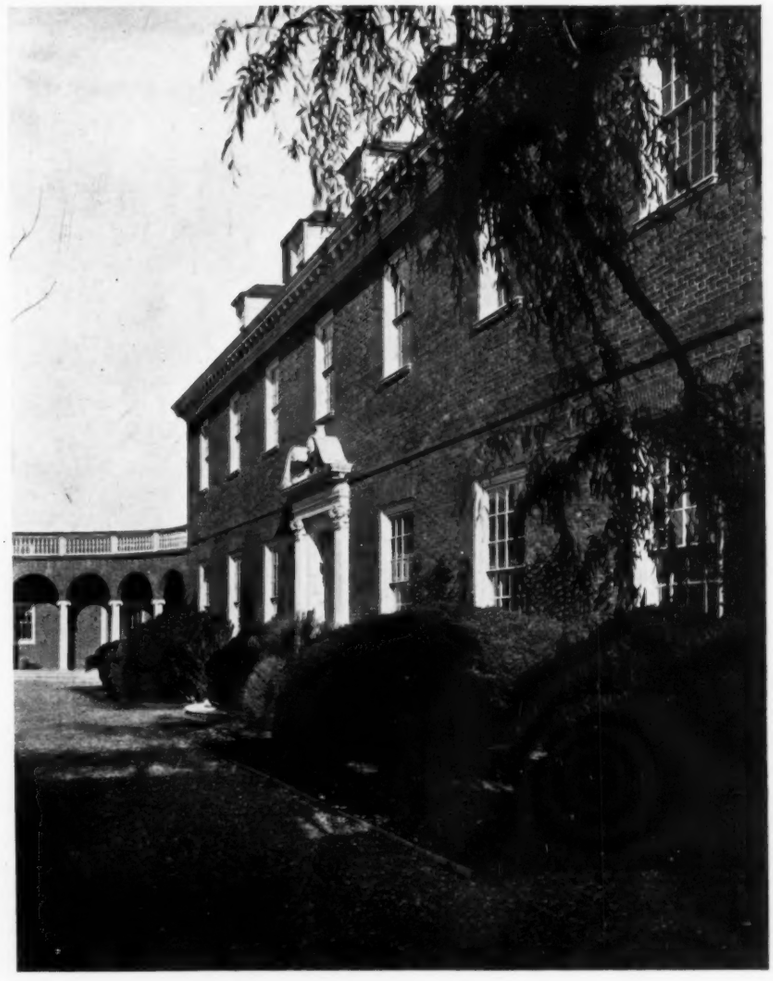
Main Front of North Wing

arranged in the center room, the easterly wall of which is all windows of the accordion type.

The curved sun room, facing east and south, is meant to catch the sun's warmth in winter. For the summer, the arched windows have been designed to drop out of sight in pockets in the floor, making the porch entirely open. The floor of this porch is warm brown and blue flagging quarried from a mountain in Virginia by the architects themselves.

The south wing, one of the two accessory buildings which are reached by the arched and curving passageways, was designed as a Spanish library, with a vaulted ceiling 26 feet high, to contain several Zuloagas and other modern pictures. It has a huge stone Renaissance mantel and the floor is to be Mexican "Colima" oak. These two low studded wings make complete houses of moderate dimensions; the schoolroom, which balances the library at the far end of the group, is temporarily used as a living room, with early eighteenth century Georgian panels, painted. The kitchen, 17 feet high, is white with trim filled out in black, varnished orange and brown chintz in backs and sides of cupboards, orange and brown tiles for hearth and sink-back, and black and white checked tile floor. The breakfast room, the only finished interior of the main house, has a Georgian mantel, green and red Japanese chintz on walls, painted furniture and black pine floor.

The entrance courtyard contains some magnificent box bushes, moved from Wading River and Stony Brook, and many willows and tulip trees. A white garden house with red domed roof, similar to that at Montpelier Manor, near Washing-



Entrance Front from Sun Room Porch

ton, is to terminate the long vista at the end of the garden.

This house differs from most recent examples of the so-called Georgian types in that it has been kept as simple as the models from which the architects were inspired. There are no large columns, supposed by laymen to represent "colonial," because colonial houses did not have large columns. We are indebted to an illustrious Democratic president, Thomas Jefferson, architect as well as statesman, for our era of double story porches. Nearly everything, except the front door and the cornice, was left to nature and to time to give an air of hospitality, dignity and domesticity. Without the friendly aid of big tulip trees and the warm effect of weathered brick, no large house such as this can help looking bare. But so did Whitehall and Montpelier Manor and Westover until nature did its work. One cannot make a new colonial house look old by covering it with white porches, shutters, columns and "stunts." It just looks unhappy and tortured. The architects' aim has been to build a background for nature's columns and ornaments,—tulip trees and box bushes, vines and green pastures, which fit infinitely better with a simple, restful structure, such as were built by our forefathers from English models, than with a complicated mass of masonry which looks interesting on a piece of tracing paper and like a nightmare in reality.

Detail of Library Window

It is not often that a large country estate is created which does not for several years present the appearance of a new arrival, and many years are usually required for the complete fitting of buildings into their setting so that they have the appearance of having always existed. The creating of this appearance of settled age is one of the functions which present day architecture is often called upon to assume.

Garden Side of Service Wing

The Planning of Automobile Sales and Service Buildings

PART II

By F. A. FAIRBROTHER
Of the Office of Albert Kahn, Architect, Detroit

A STUDY of the general characteristics of automobile sales and service buildings, with some consideration of suitable arrangements for sales and stock rooms, is contained in the first part of this article published in the August number of THE ARCHITECTURAL FORUM. The portions of the building more particularly concerned with the sales part of the business have been considered and we come to the other portions devoted to the uses which we call service.

The most important service portion of the building, if of the type where cars are received for adjustments and repairs, is the garage. A part of the ground floor of nearly every building where automobiles are sold must be set aside for this purpose. A garage would be omitted only in cases where the building is located on a very valuable and somewhat small piece of property or else where there is such a large distributing and assembly center that it could be classed as a factory. In the former case the building could be called a sales building, but not a service building, and in the latter case it could be called a service building only by reason of its serving the local dealers of a manufacturer and not because of any direct service to the owners of cars.

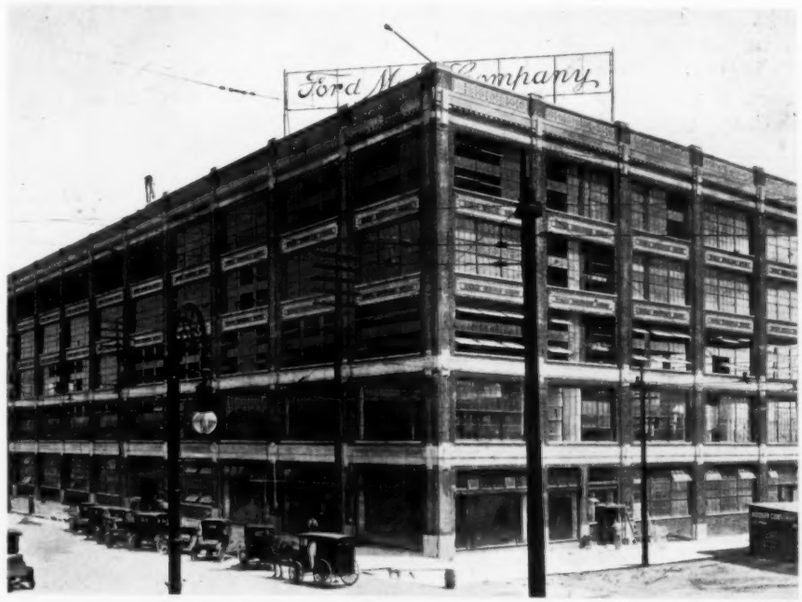
The size of the garage depends upon the size of the territory which is served. It must, of course, have entrances direct from the street or yard and, if large in area, it should have separate "In" and "Out" doorways.

The requirements that govern the arrangements of the garage are varied. If the service building is small and it is necessary that much of the small repair work and minor adjustments be made in the garage, this will require a considerable space where cars may be run in and repaired and sent out again quickly. Still other portions must be reserved as parking places and a considerable space reserved for maneuvering cars. The problem is not greatly different from that encountered in any commercial garage except that it is not likely that cars will be taken in for day parking.

In most cases the first of the large service stations built by the automobile manufacturers had large ground floor areas reserved for garage purposes. In the case of perhaps the largest manufacturers of motor cars in this country the space devoted to this purpose has grown steadily smaller as the selling, and consequently the need of caring for their product, has been placed in the hands of smaller dealers, until at the present time the garage provides only enough space for the employes' cars. The space formerly used for the garage is now used for the storing of the day's grist of new, assembled cars which are driven away over the roads or otherwise shipped to the stations of the dealers.

The first floor plan of the Ford Motor Company's building in Omaha, Fig. 6, shows a service building where considerable space was set aside as a garage. In this building the garage space has practically been done away with.

The garage is the place where the customer brings his troubles and it must be arranged in such a way that the sympathetic attention of the service man is readily obtained and the troubles easily taken care of, if of a minor nature fixed up expeditiously or, if of a more serious sort, some action started to relieve the difficulty. Indifference and inattention to the needs of a perhaps worried or excited customer will quickly breed dissatisfaction and will belie the name of the sort of building we



Building for the Ford Motor Company, Omaha, Neb.
Albert Kahn, Architect

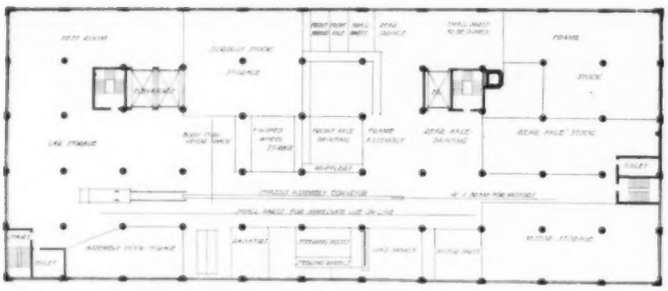


Fig. 9. Third Floor Plan

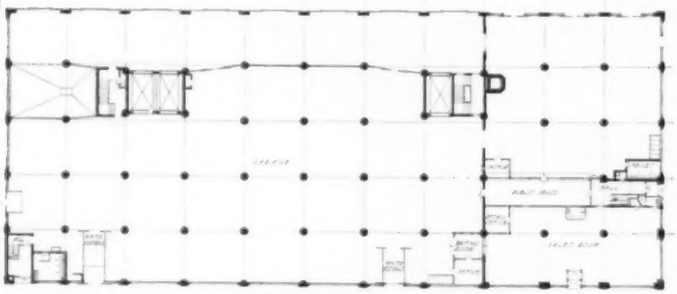


Fig. 6. First Floor Plan, Ford Motor Company, Omaha, Neb.
Albert Kahn, Architect

are discussing. Real service should be given here.

An enclosed room should be provided for the garage superintendent where the business of the service department will be directed. Some space in this office, or in an adjoining room, may well be provided where customers can sit down quietly with the service men and talk over their troubles and decide what is to be done in the way of repairs and adjustments. Provision is frequently made in some of the buildings, especially those handling high class cars, for a locker room where customers leaving their cars for repairs may lock up their robes and other valuables.

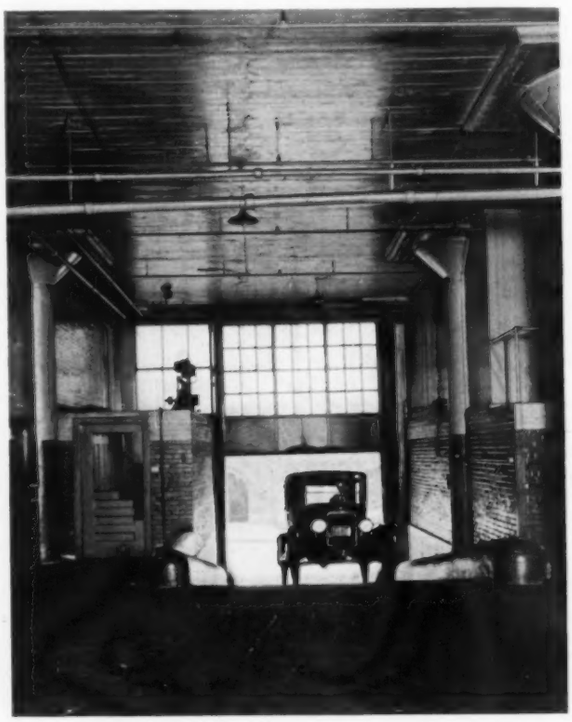
It is well to arrange that sparking devices of any sort, such as battery charging units, forges, etc., be kept somewhat remote from the garage spaces. These particular features will be touched on later.

Some provision is required for wash racks where customers' cars can be washed and put in shape before being delivered or where cars can be groomed before being placed on the show room floor. Where the garage floor rests on the ground a mere depression in the floor with a sump or floor drain at its lowest level makes a very satisfactory arrangement for washing cars. Where the wash rack is on a supported floor it should be surrounded by a curb and drained from a floor drain fixture into a separate sump or sand catcher basin to separate dirt and grease from the drainage water before it passes into the sewer.

Ventilation of the garage is necessary at certain seasons of the year if there is to be any attempt made to provide comfortable working conditions for employes. During cold weather, when all openings are closed and gases of combustion cannot readily find their way out through open doorways or windows, some means should be provided for removing them. In many cities the laws require that exhaust connections be provided for this purpose. These are arranged for by means of pipes or ducts brought down to a point near the floors and equipped with a flexible hose connection on the end of each branch. These connections are arranged so that cars being tested or tuned up may be linked up with the ventilating system by slipping the flexible hose connection over the exhaust pipe on the car, the fumes of gas thus being drawn away.

This arrangement is very good and should be the most satisfactory way of meeting the difficulty but it is found that the simple act of connecting the flexible hose to the exhaust is too much trouble for the average workman, who evidently prefers to work in a cloud of gas fumes in spite of the fact that it impairs his health and efficiency.

Another good plan consists of a suitable arrangement of ducts running along the wall or ceiling with branches dropped down at the proper points to draw the heavy gases from the floor. This plan is good for the reason that it is not dependent for its efficiency on couplings made directly between the pipes and the exhaust from the cars. Scuppers located in the walls near the floor level are a help in that they provide a



Entrance Ramp in Overland Building

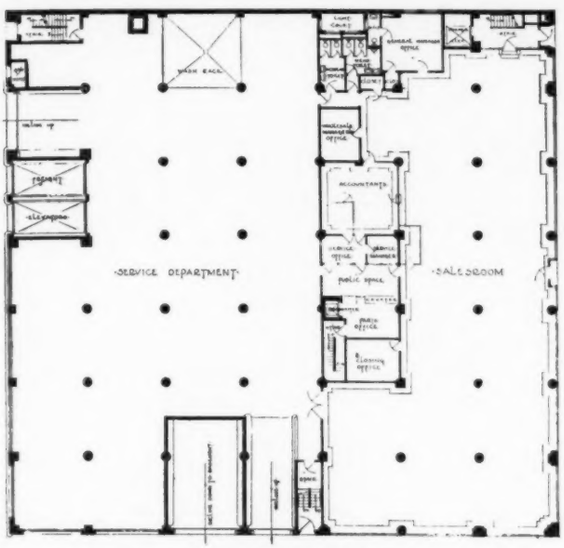


Fig. 7. First Floor Plan

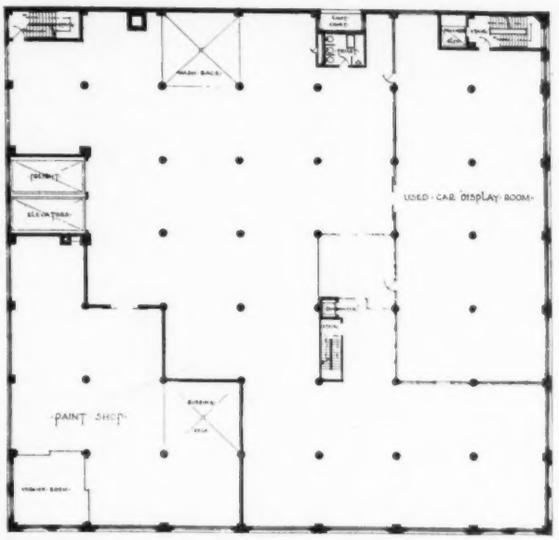


Fig. 8. Second Floor Plan

means by which heavy gases can flow out, but they should be provided with some sort of dampers to prevent the winds reversing the desired flow of gas and spreading it about the building.

If the ground area available is large and the land not too valuable it is quite possible that all the various features of the typical sales and service building can be provided on one floor level. This doubtless would be the best possible arrangement and would do away with the necessity of elevators, stairs or ramps. But this condition is the exception to the rule and we find that the majority of service buildings are of more than one story and, therefore, require that some of the departments be located above the ground floor.

These departments would naturally be those where rather extensive repair work is done and, in addition, would include the spaces where cars are assembled, if that sort of work is done in the building at all. Such space as is devoted to the storage of cars might also be on an upper floor.

The size of the repair department and machine shop will depend somewhat upon the character of the car which is dealt in, as it is certain that some cars require more repairing than others. It will also depend upon the size of the territory covered. The space must be determined by a study of the dealer's requirements and the number of repair jobs which he usually takes care of during a day. The parking space for repair jobs should be arranged against good light and in front of a bench which extends the whole length of the department.

A cleaning tank is a desirable feature in connection with this department and in some cases has been placed at the end of a trolley beam extending along the ceiling and located over the front part of the cars below. This allows for the heavier portions of the cars, such as motor parts, being

Building for Willys-Overland Company, St. Louis, Mo.
Mills, Rhines, Bellman & Nordhoff, Architects

lifted off and cleaned by dipping them into the tank. The trolley beam, of course, is useful for other purposes as well.

The machine shop should adjoin the repair department and if the whole department is at all remote from the stock room, a small separate tool crib will be desirable. The machine shop need not be large, as standard replacement parts are usually available. In most cases a lathe, drill press and grinder are required and often a babbitt pot. It should be noted that this latter is sometimes classed as a sparking device and is, for that reason, regarded by some building departments as a fire hazard and must be placed in a separate room not too far away. Sometimes the forge room must also be placed elsewhere, possibly with an entrance through a vestibule or other suitable passage open on one side to the outer air, somewhat after the customary arrangement of entrances to smoke tower stairways. In many cases the requirements are not as stringent and a curb, say six inches high, across the entrance to the room is sufficient.

The spacing of cars in the repair parking space will depend upon the spacing of columns but it may be assumed that eight feet on centers for ordinary cars is about as close as they can be spaced for repair work. For working on trucks the spacing should be greater. Where building columns are located say 25 feet apart it should be possible to work on three pleasure cars or two trucks in each bay.

Repair pits are not in such general use now as they were in the past. Besides cutting up the floor construction, they have been found to be a source of danger. Where they are required, however, it is sometimes possible to arrange an opening in the floor and provide a suspended cage below the opening which has a wire screen enclosure around

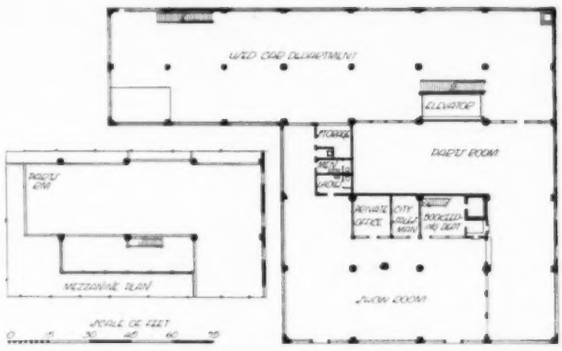


Fig. 11. Building for Perry Motor Company, Kansas City, Kan.
Hoit, Price & Barnes, Architects

the sides and enough openings to afford means of escape in case of fire. An open arrangement of this sort will eliminate the danger of workmen being overcome by the accumulation of heavy gases.

A battery room where tests can be made and batteries charged is usually required. In some cities this will have to be arranged in a separate room with an open air entrance if it is on the same floor as the garage. Usually, however, no precaution is necessary other than arranging that no sparking connections be located nearer than four feet from the floor, or else the provision of a curb at the entrance to the room similar to that often required for the forge room.

A certain amount of service work will consist of painting and varnishing and separate spaces should be arranged for these departments. The rough and the finished painting work can probably be done in the same enclosed space but it is well to have the varnish room separate and arranged so that it will be as free from dust as possible. A rubbing deck will be required for the painting and varnishing departments which should be well drained.

If a considerable amount of enameling is done, as will be the case where cars are assembled, and parts such as fenders, bonnet covers, etc., are shipped in, nested and crated separately, there should be enamel baking ovens, and vents will be required. While such vents can be carried up through one or more stories, it would naturally be more convenient to locate the ovens on the top floor. This would suggest the placing of the enameling, painting and varnishing rooms together on the top floor where they would be free from dust. Varnish and drying rooms should be heated to a temperature of 80° Fahr.

If space on this same floor is available it would be convenient to locate the upholstery shop here, but as this department is apt to be dusty it should be separated from the

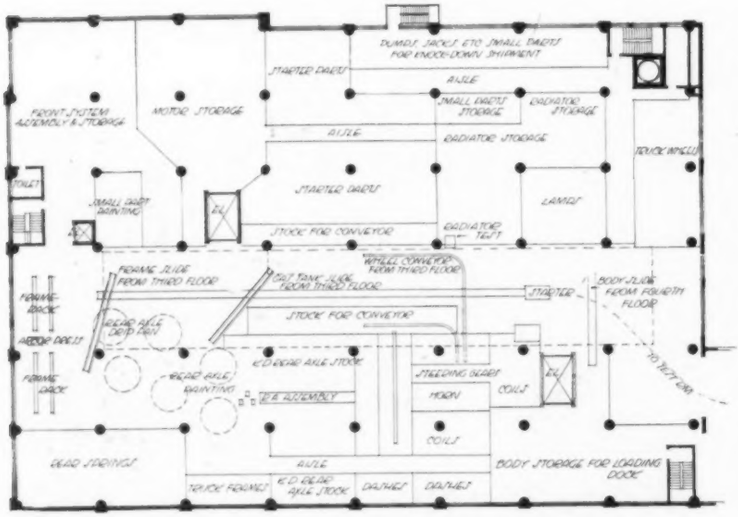


Fig. 10. Second Floor, Building for Ford Motor Company, Chicago, Ill.
John Graham, Architect

car painting sections by dust-proof partitions.

The problem of storage space for automobiles deserves considerable attention. In numerous cases distributors have been compelled to rent space in various places to take care of the cars at certain times of the year. One case is on record where a distributor, who was contemplating the erection of a new building, had cars stored in rented spaces in five different places. Usually ground floor space is too valuable for storage but in cases where a basement is provided, it may be used for this purpose satisfactorily. If the storage space has a reasonably high ceiling it may be possible to store cars in two tiers by providing inserts in the ceilings from which the cars may be suspended by cables or by constructing a steel framework having angle iron tracks on which cars are placed upon the suspended framework by means of a traveling transfer platform. Both of these arrangements have been used in the service buildings of the Willys-Overland Company, designed by Messrs. Mills, Rhines, Bellman & Nordhoff.

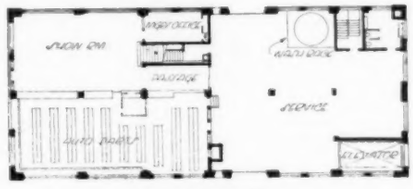
Inclined ramps have been used in a considerable number of recent city garages and to some extent in sales and service buildings. They afford an inexpensive and easy means of passage from floor to floor, but require considerable room. Where it is not necessary that cars be handled with speed it is quite probable that elevators will suffice.

Ramps giving access to both the basement and first floor of the Willys-Overland Company's building in St. Louis are shown in the plans of this building in Figs. 7 and 8. This arrangement gives easy access to these two floors and relieves the elevator considerably but it would evidently use up too much room to extend them to upper floors.

A 10 by 20 elevator platform will suffice to handle any pleasure car. If trucks are handled in the building the platform will have to be longer and perhaps wider. It is the practice of one of the manufacturers of large passenger cars, who also makes trucks, to provide elevator platforms 12 feet wide and 30 feet long and in some cases even 35 feet. The longer platform will accommodate two passenger cars. An example of an elevator platform wide enough for two cars abreast is seen in the plan of the service building for Mr. C. C. Coddington, Fig. 5, in the first part of this article.

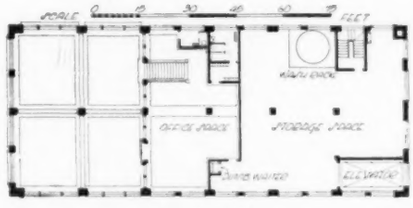
The location of the elevators is very important and considerable study will be required to place them in the best positions. They should be located, when possible, adjacent to the main aisles on all floors, but often it will be desirable to place them against outside walls that they may be entered from the street or yard, thus avoiding considerable traffic through the ground floor.

Regard should be paid to the ease of turning off or on to the elevator platforms. Service men say that it should be arranged as far as possible that cars can be driven head on to or from them instead of being backed on or off, especially if cars are driven to or from the elevators by anyone other than the employes of the station.



Second Floor Plan

Third Floor. All Work Space



First Floor Plan

Numerous arrangements of elevator doors and gates are used and it is difficult to tell which scheme in the long run is the best. The most common arrangement is to provide some sort of a fire curtain at each floor and a smaller gate on the inside of the opening which will slide up out of the way when the car is at the floor level. The greatest disadvantage of this plan is that the elevator shaft is always open and heat from the lower stories is very apt to find its way to the top. The elevator shaft openings may be equipped with solid

Fig. 12. Ford Agency for R. P. Rice, Kansas City, Kan.
Smith, Rea & Lovitt, Architects

doors which will be heavier than the gates just mentioned, but which have been found to work satisfactorily. Both the gates and the solid doors should be provided with some form of mechanical operators. The ordinary type of full automatic gates which lift and fall every time the elevator platform passes a floor are too cumbersome for the usual freight elevator.

A lifting capacity of 10,000 pounds is as great as will be required for any building unless especially heavy trucks are to be handled. Usually a lesser capacity is sufficient. The speed will vary with the number of floors to be served, from 50 to 150 feet per minute being about the usual range.

In many cases it is customary to extend the freight elevator to the roof, thus giving an open air space where engines may be tested and tuned up. When the roof is used at all extensively some durable paving should be provided on top of the composition roofing.

The proper spacing of columns for the most convenient use requires careful consideration. It is found that the ideas of different service building owners vary as to what is most suitable. While the size and shape of the property will influence the natural widths of the bays it is desirable that the spacing be adjusted to allow of parking cars between the columns without waste of room.

The kind of car to be used will have a definite bearing on the space required. While the overall width of the largest passenger car is not much greater than the smaller, the radius for turning of the larger cars is considerably greater and this must be taken into consideration in determining what is best.

A spacing of 23 feet 6 inches in width works out very well and will allow of parking large pleasure cars and still leave plenty of room for getting in and out. A length of 16 feet, approximately, is required for parking. The width of aisle will vary with the length of the car to be accommodated but 28 feet between column centers will prove an ample space for maneuvering the largest passenger cars or trucks with ease. An aisle between columns 20 feet on centers is nearly the minimum.

In some cases it has been found that the equipment to be installed in the building, such as motors, trolley beams, sleeves, etc., can be laid out in advance and the proper bolts for supporting them can be placed in the floor or ceiling construction when the concrete is poured. But in most cases it is better to provide some system of threaded or slotted inserts placed at regular intervals to support equipment which may be placed. These inserts can be used for supporting pipes. It will be necessary to provide a system of compressed air piping and a compressor in practically every building. Outlets for tire inflation and numerous other purposes may be provided wherever required.

Gasolene and lubricating oil storage is regulated by law in different cities. The rules governing installation vary greatly and it is necessary to consult the codes to find exactly what is allowed. Some cities will allow tanks buried beneath the floors of the building and some will insist that tanks be placed at a distance or under the sidewalk. The amount of gasolene which it is permissible to store also varies. If the building is large and possesses a railroad siding it may be possible to provide one or two large tanks sufficient to hold somewhat more than the standard railroad tank car. The quantities of gasolene which different service stations require will range from the large tank capacity to the amount which can be contained in the portable gasolene buggies used in the smaller garages. For the average service station, say one with 35,000 square feet of floor space, two one-thousand gallon tanks should be ample.

The quantities of lubricating oil which it is desirable to keep on hand will likewise vary and unless a very large amount is required it can be handled very well by providing some sort of cradles on which oil drums can be placed and equipped with a barrel lift over the top for convenience in handling them. It will be found a good scheme to provide a sort of curb around the gasolene pumps or oil barrels to keep the drippings from spreading around the floor.

Pumping stations can usually be arranged so that gasolene can be drawn by direct suction to points on the first floor of the building provided the pull is not much over 12 feet in localities near sea level. When it is desired to raise it to upper floors it will either be necessary to arrange the pumps so that they will occur directly over the suction valves below and the gas raised above the suction valves by a direct lift, or else to install a pressure supply system delivering gasolene according to measure at the outlets. The latter system is somewhat more expensive but, naturally, more flexible.

Car assembly is an activity which is carried on to some extent in most large service stations. In most of the buildings owned by the Ford Motor Company, cars are assembled and in the large buildings bodies are likewise assembled and all the painting and upholstering done. The various parts are arranged in suitable locations to allow of feeding into the travel line of the assembly conveyor at the proper point.

The third floor plan of the Ford Motor Company's assembly and sales building in Omaha, Fig. 9, shows the arrangement of the assembly conveyor and the disposition of the stock parts to be incorporated in the finished car. As will be noted frames, rear axles and motors require the largest storage spaces on the floor. Preliminary assembly of frames and rear axles is made near the storage space and placed on the traveling conveyor at the end. As the conveyor travels along, the additional parts, such as front axle, springs, gas tanks, steering posts, etc., are secured to the chassis.

The bodies which are assembled and prepared on the floor above are brought down to the main

assembly on the elevator and placed on the chassis just before it is run off the conveyor as a practically completed automobile.

From the point of assembly where the engine has been started running by a device which spins the rear wheels rapidly while the clutch is engaged, the car is run by its own power to the test room where necessary adjustments are made, after which it is taken to another floor for storage or to the yard for driving away or for shipment.

The Ford building in Chicago, a plan of which is shown in Fig. 10, was originally arranged with a craneway in the center by means of which railroad cars could be unloaded and their contents distributed to the upper floors. The feature of unloading from railroad cars by the overhead crane has been done away with in this building but the space previously used for this purpose is now used for the assembly of cars. Different parts of the cars, as will be noted by the diagram, are brought down from the upper floor on chutes or slides; wheels, frames and gas tanks come from the third floor and bodies from the fourth floor.

The plans of the building for the Noyes-Buick Company in Boston, Figs. 13 and 14, Arthur H. Bowditch, Architect, show a very complete layout of a sales and service building for a distributor controlling a large and populous territory.

In this building separate sales rooms are provided, one for trucks and one for pleasure cars, both located on the main floor. In addition is a show room located on the second floor for the display of special

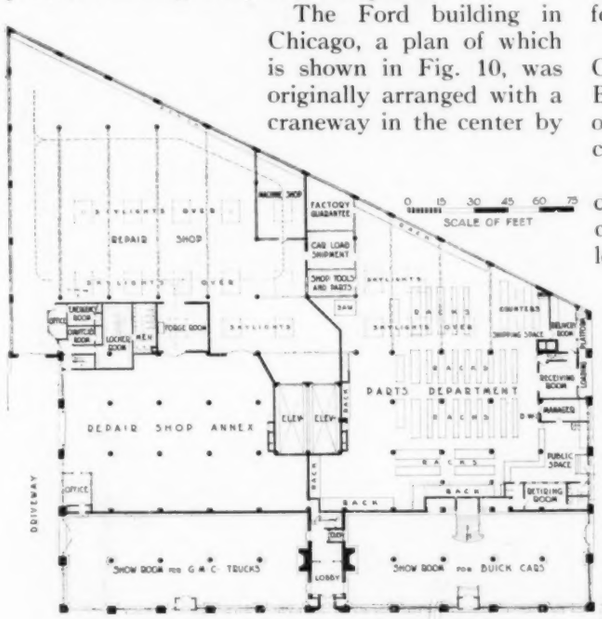


Fig. 13. First Floor Plan

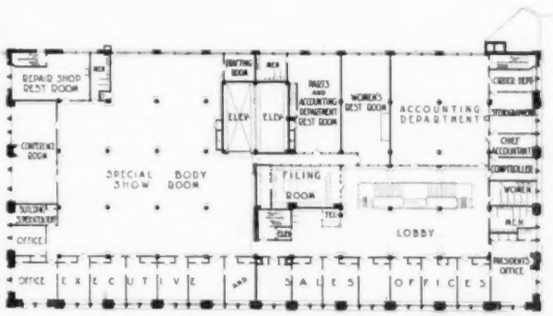


Fig. 14. Second Floor Plan

Sales and Service Building for the Noyes-Buick Company, Boston, Mass.
Arthur H. Bowditch, Architect

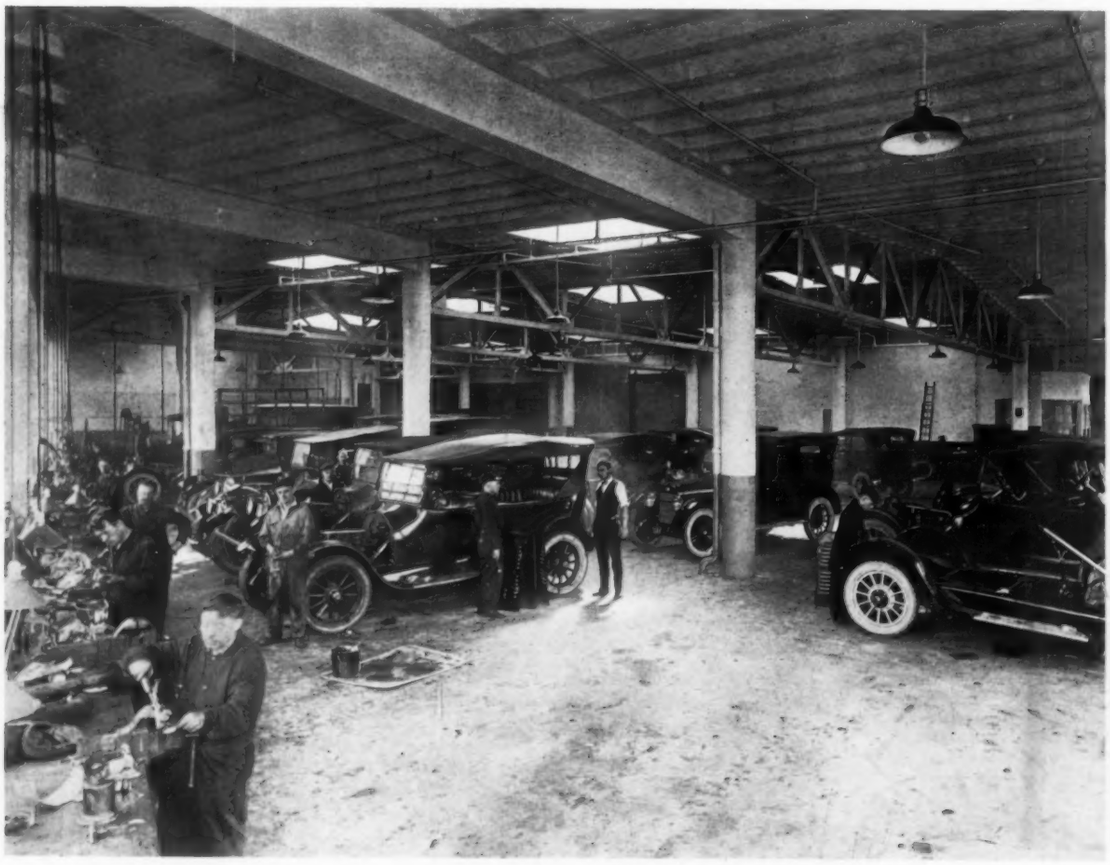
bodies. The entire basement, which is reached by an outside inclined driveway, is used as a garage where new cars and trucks are prepared for delivery. The main access to the elevators is arranged for at this lower level. The greater part of the third, fourth and fifth floors are given over to the storage of pleasure cars and trucks.

The planning of this structure, which is now regarded as the last word in sales and service buildings, embodies every conceivable convenience for patrons as well as for employes. Everything has been carefully planned for a reason. The object was to secure ample room for the transaction of business and to provide for constant expansion and also to be able to carry on the work with all possible efficiency. Every effort has been made to create agreeable surroundings for those whose work plays so great a part in the success of the business.

The buildings now under construction in Kansas City, Kan., for the Perry Motor Company, Fig. 11, and for Mr. R. P. Rice, in the same city, Fig. 12, illustrate an excellent type of service station adapted to the needs of the local city dealer. In each of these buildings the contour of the ground is such that the lower story may be used as the garage, giving the greater part of the main floor for sales room, used car show room, offices and sales rooms for parts. The upper floors are open spaces and are used for repairs, storage, etc.

The question of the arrangement of offices is entirely dependent on the requirements of the occupant of the building. For the smaller service building it is very often possible to use a mezzanine back of the show room as is done in the service buildings in Kansas City just mentioned. Where the offices are larger the usual space available on a mezzanine is apt to be too restricted and too low and the second floor or an adjoining space on the main floor is more desirable.

We have attempted to point out only the salient points of the problem and to describe them in a general way. Problems will be found to vary greatly but the different points which have been brought out, it is hoped, will be of some assistance to anyone engaged in the study of the problem of planning an automobile sales and service building.



Repair Shop in Sales and Service Building for the Noyes-Buick Company, Boston, Mass.
Arthur H. Bowditch, Architect

Early American Domestic Architecture

II. THE WELLINGTON HOUSE, NEAR WALTHAM, MASS.

MEASURED DRAWINGS BY EDWIN J. HIPKISS
(Member of Staff, Museum of Fine Arts, Boston)

DESIGNING in the spirit of any period is greatly aided by study of good examples of the work of the period being interpreted.

It is fortunate that notwithstanding our past indifference to noteworthy early American work and the vandalism which has destroyed so many examples, a more intelligent interest is now caring for the best work *in situ* and is garnering into museums many old doorways and mantels.

The Wellington house, near Waltham, Mass., built about 1750, affords an opportunity for the study of eighteenth century American work for, thanks to intelligent ownership, most of its old-time dignity and simplicity have been preserved. The tiny bay window shown in one exterior view is of course an architectural aberration, and the removal of the cyma of the cornice to make way for a wooden gutter is distinctly unfortunate, but both errors may be easily remedied.

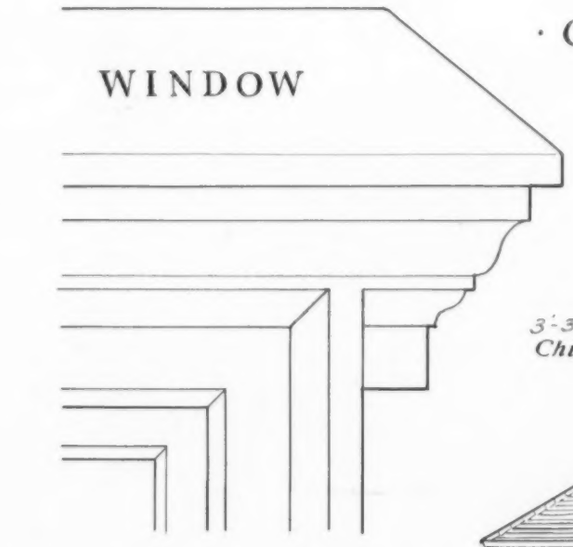
Tradition asserts that the lumber for both frame and finish of the house was cut and worked into form on the property, but tradition is silent as to the designer whose eye and hand determined the scale and sequence of details which possess individuality though they conform to a type.

Architects are often puzzled to account for the excellence of design in most eighteenth century American work. We know, however, that by the middle of that period taste and building tradition had become well established. Every skilled worker in wood owned his set of moulding planes and close study reveals the simplicity of their geometrical forms. There were, in general, convex and concave quarter rounds, thumb mouldings and ogees of various sizes—the very elements of good form.

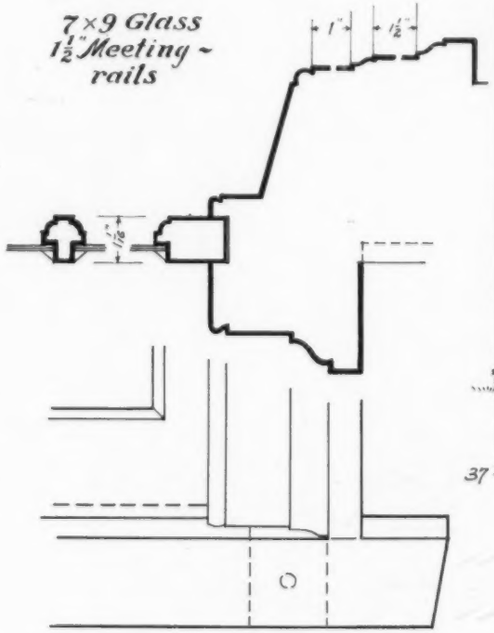
Under the Georgian influence of England this simplicity of expression took on a high quality of directness and sincerity which resulted in great excellence of work by thoughtful designers. Such work was no doubt then taken as a matter of course while it is now valued as a matter of American art.

· DETAILS · ARE ·
· QUARTER · FULL · SIZE ·

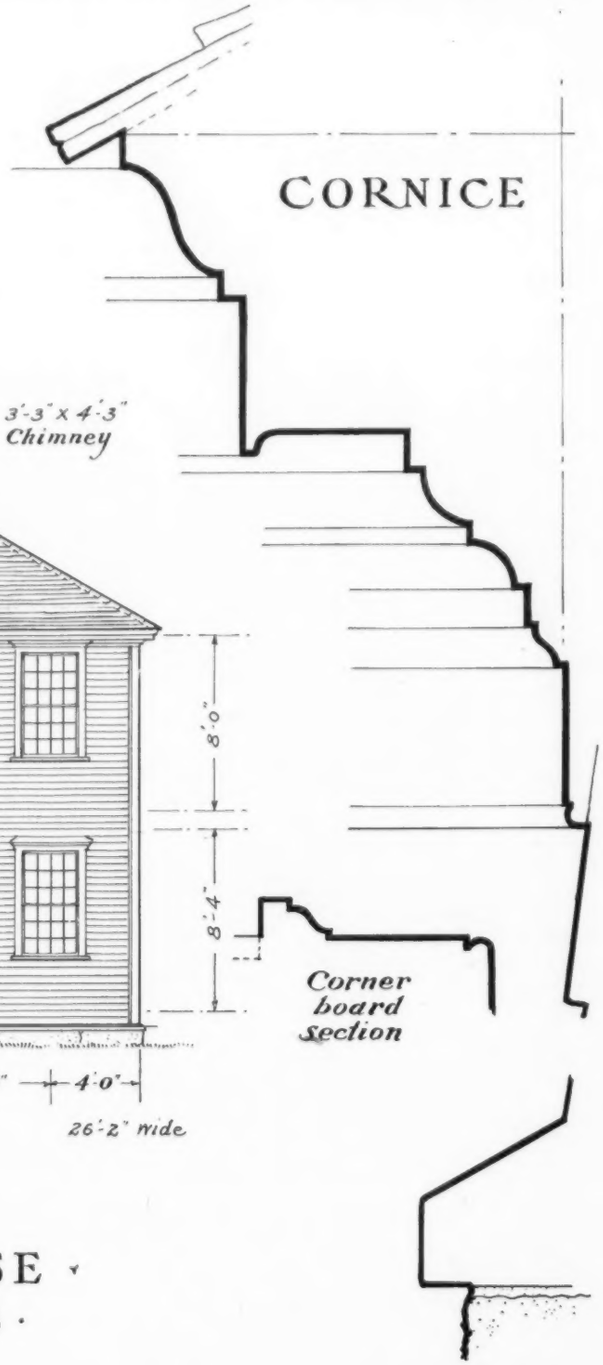
WINDOW



7×9 Glass
1½" Meeting-rails

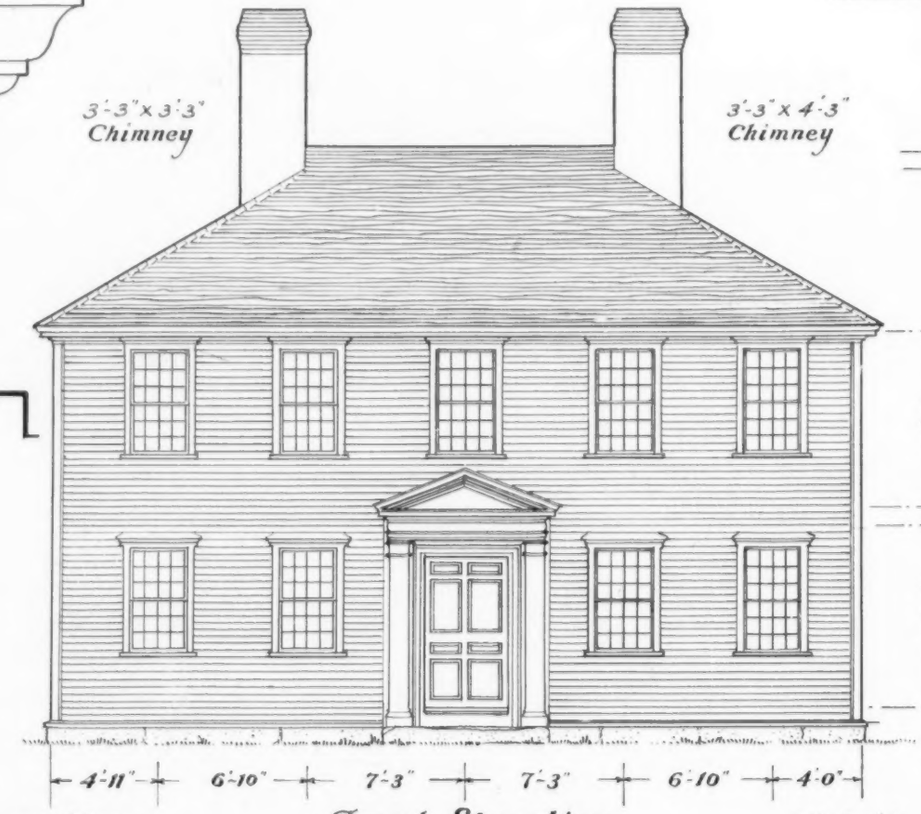


CORNICE



3'-3" x 3'-3"
Chimney

3'-3" x 4'-3"
Chimney



Corner board section

4'-11" | 6'-10" | 7'-3" | 7'-3" | 6'-10" | 4'-0"

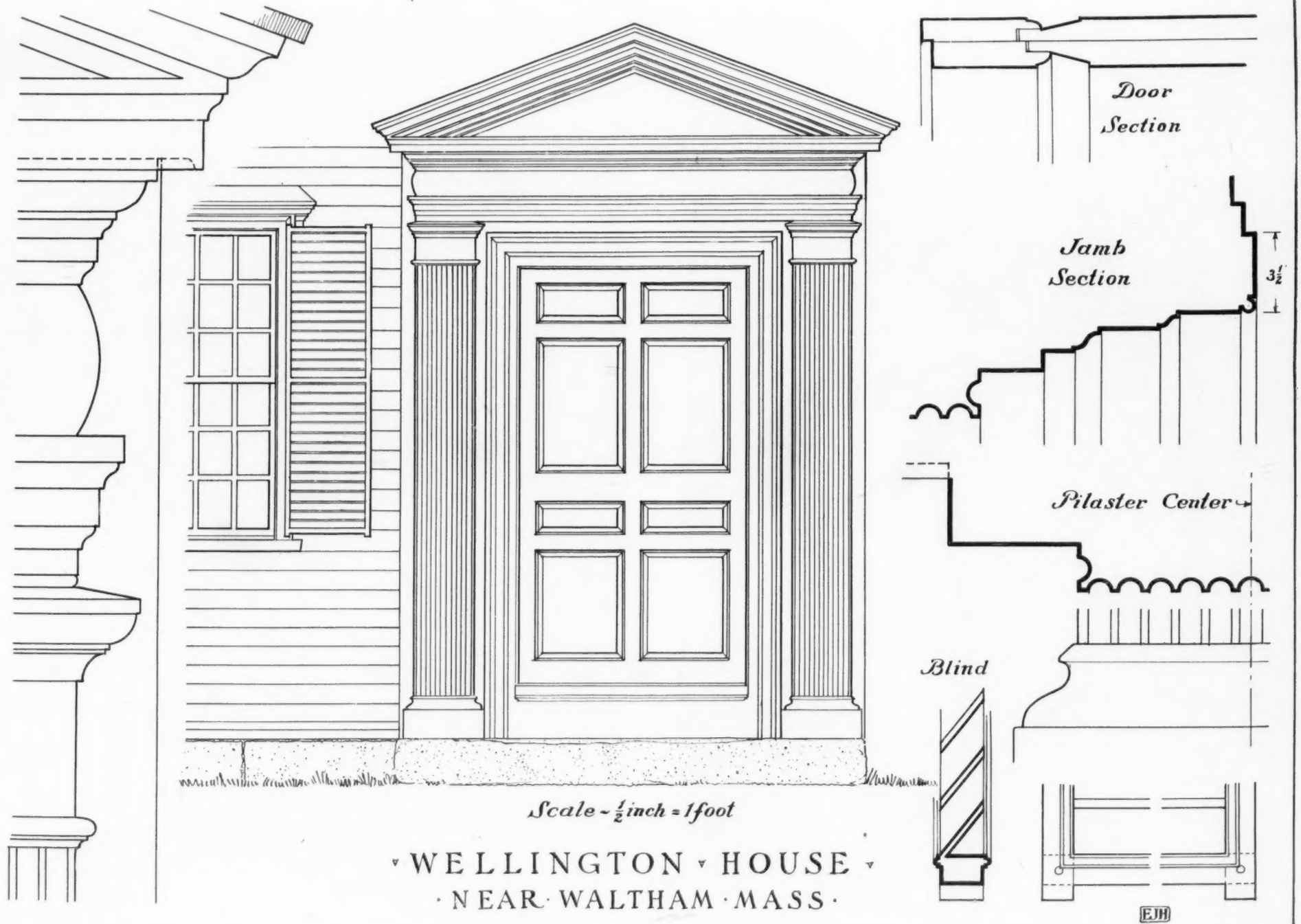
37'-1" long

26'-2" wide

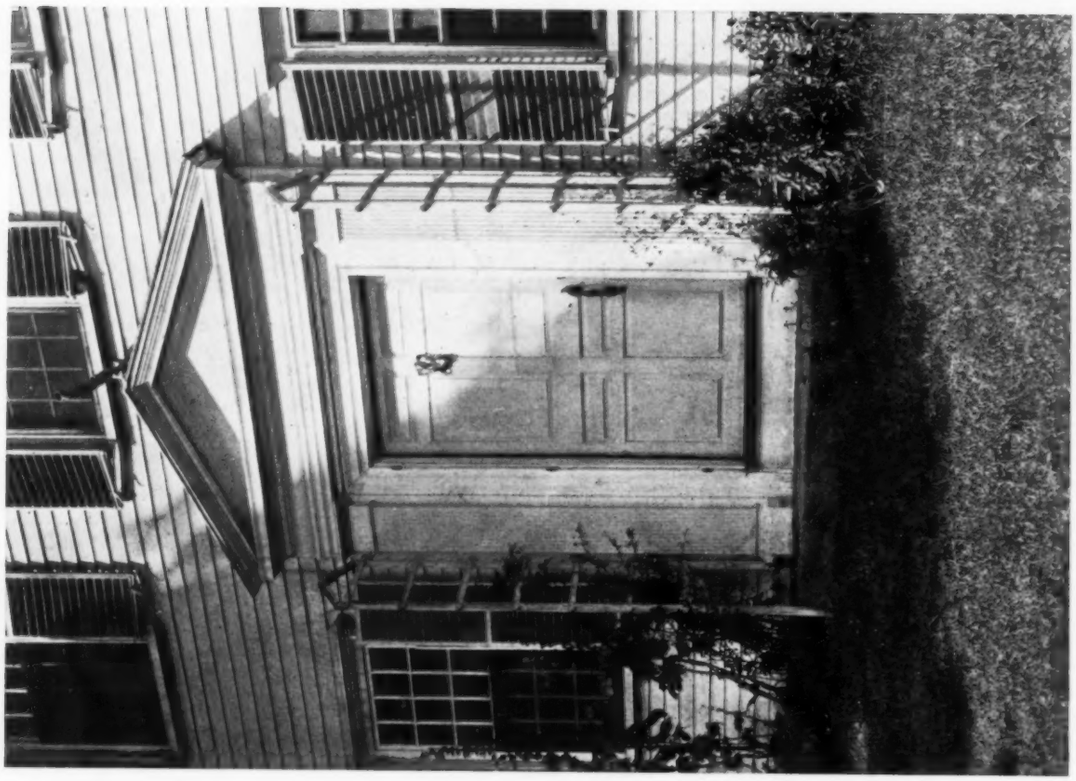
Front Elevation
Scale - ⅛ inch = 1 foot
(Blinds omitted)

· WELLINGTON · HOUSE ·
· NEAR · WALTHAM · MASS ·

EJH



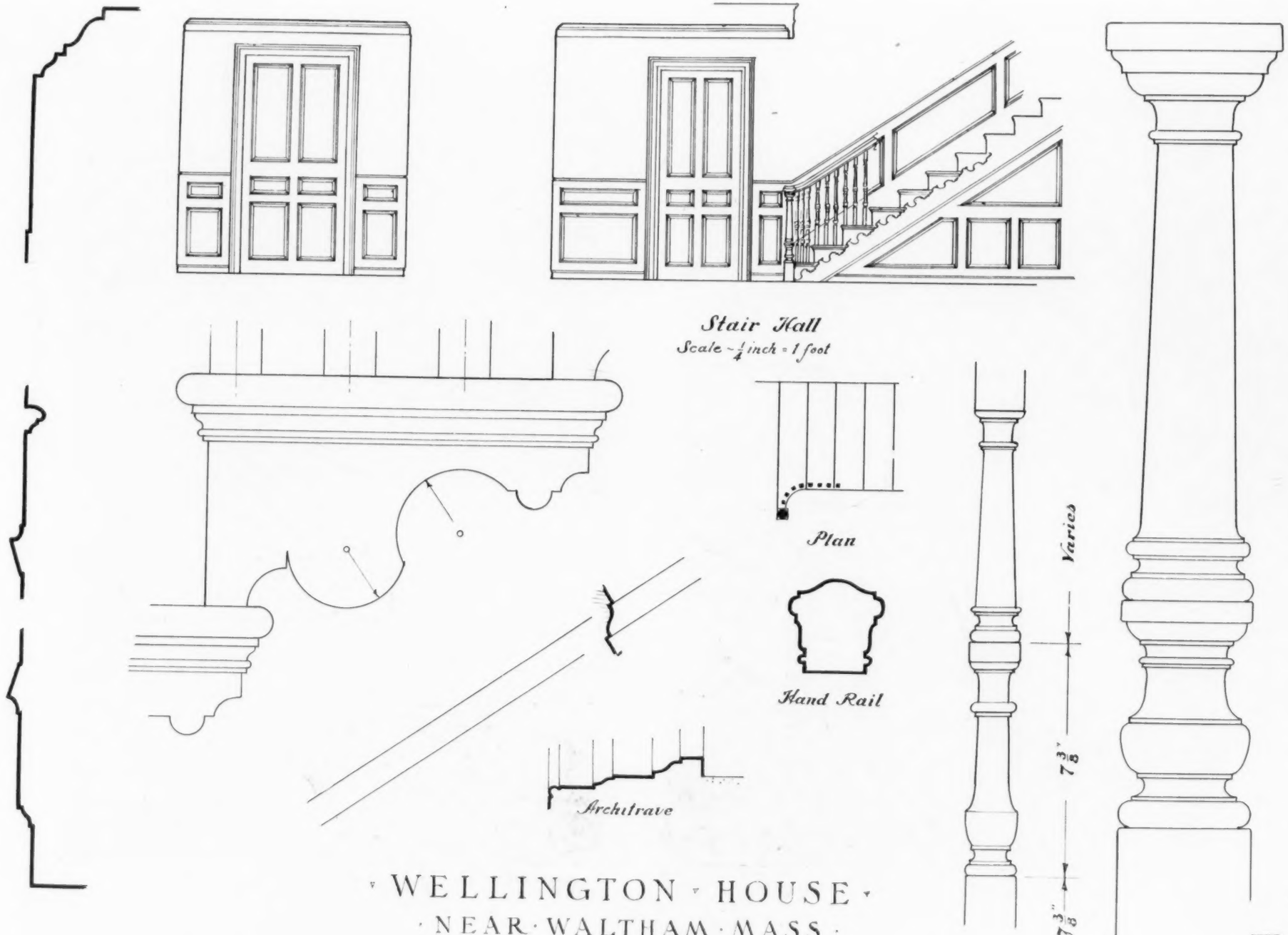
WELLINGTON HOUSE
NEAR WALTHAM MASS



MAIN DOORWAY

STAIR HALL

WELLINGTON HOUSE, NEAR WALTHAM, MASS. BUILT ABOUT 1750

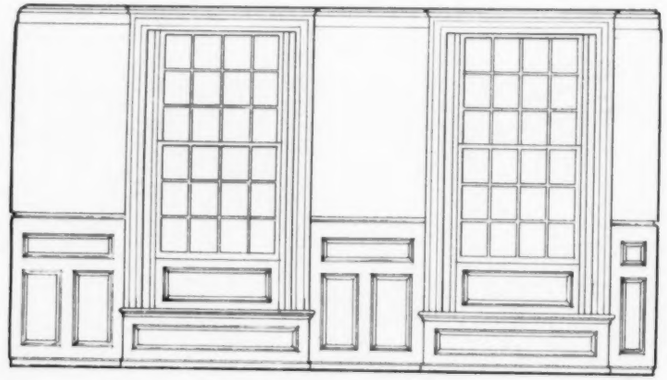


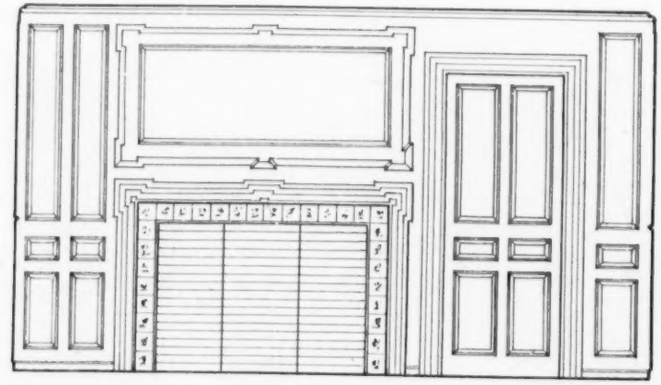
WELLINGTON HOUSE
NEAR WALTHAM MASS

DINING ROOM MANTEL

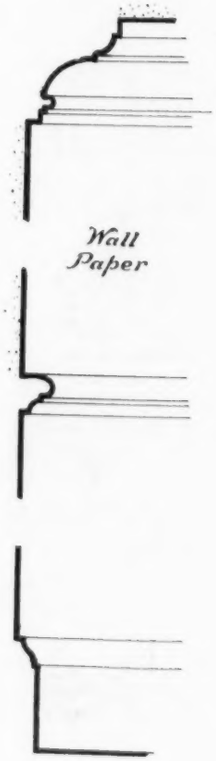
PARLOR MANTEL

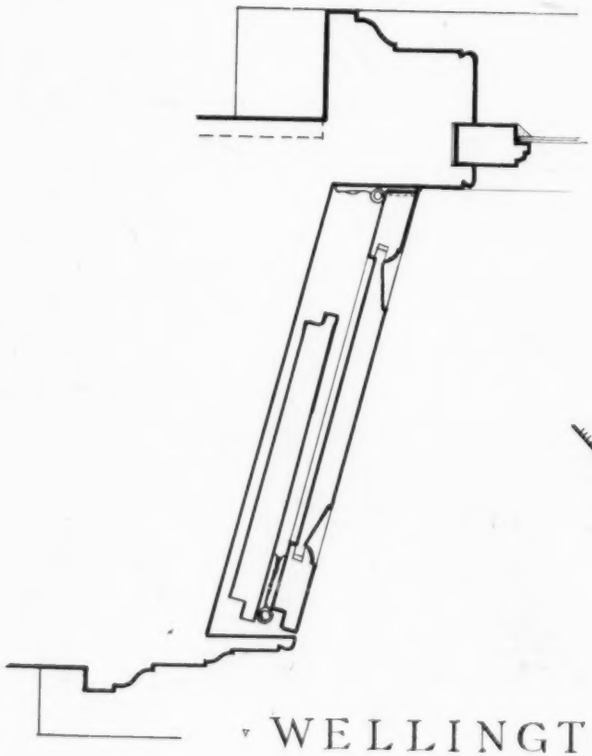
WELLINGTON HOUSE, NEAR WALTHAM, MASS.

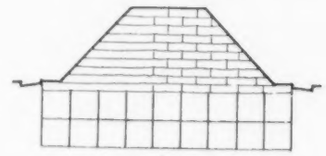


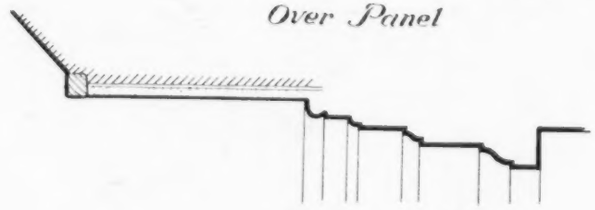


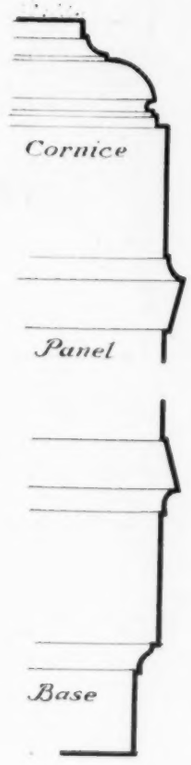
Parlor
Scale - 1/4 inch = 1 foot





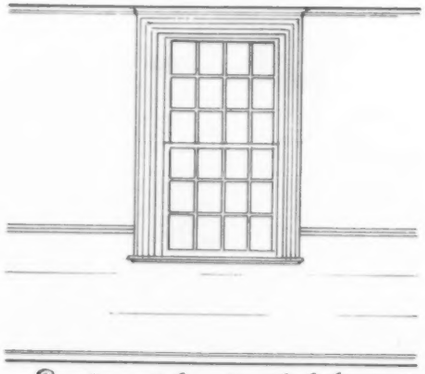




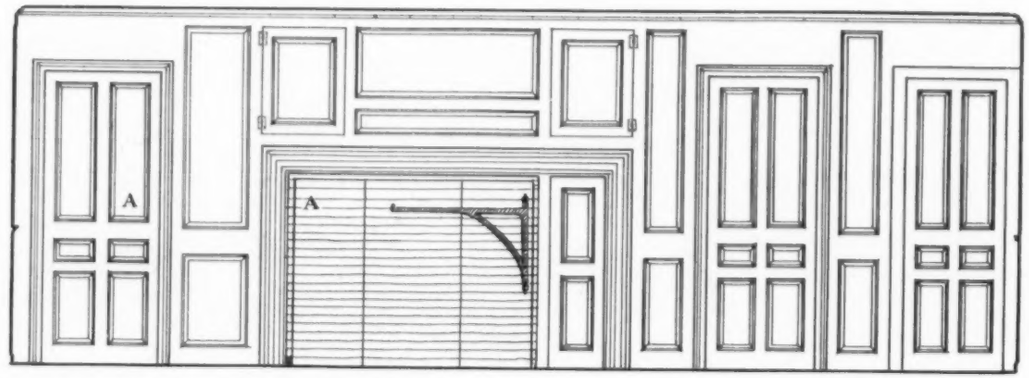


WELLINGTON HOUSE
NEAR WALTHAM MASS

EJH

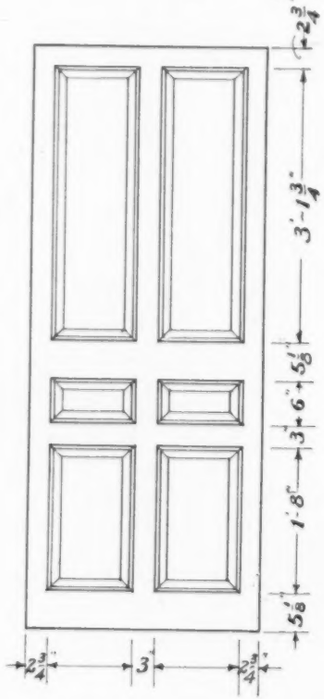


Dado of horizontal boards

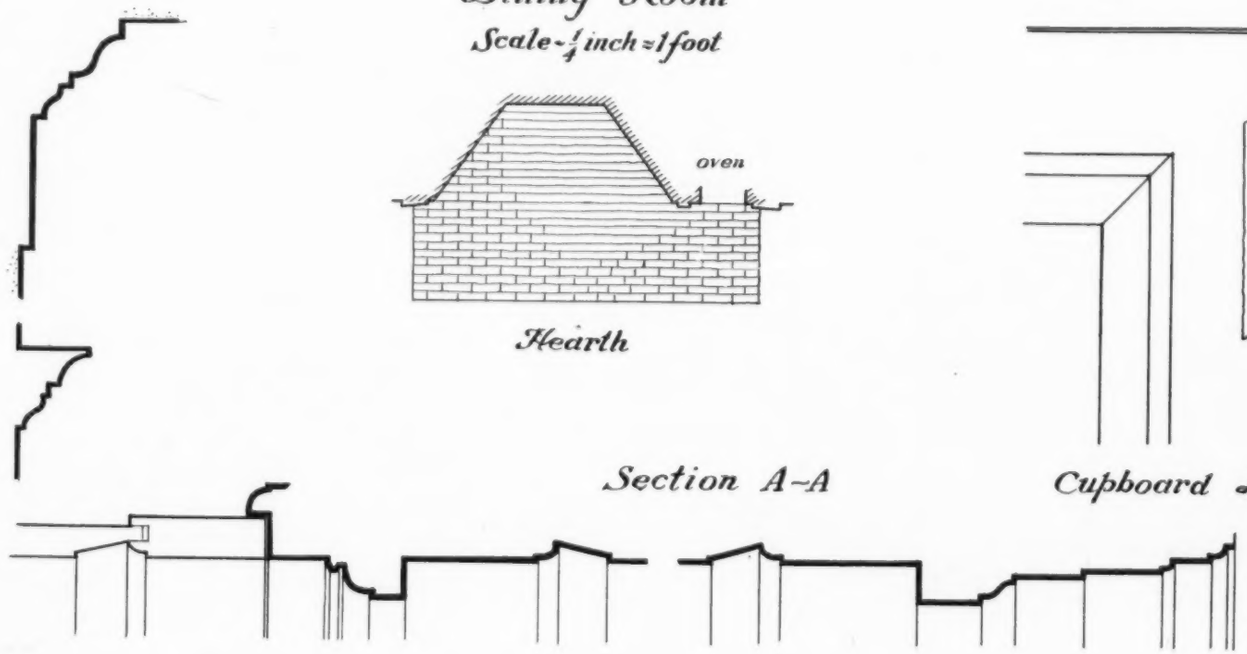


Dining Room

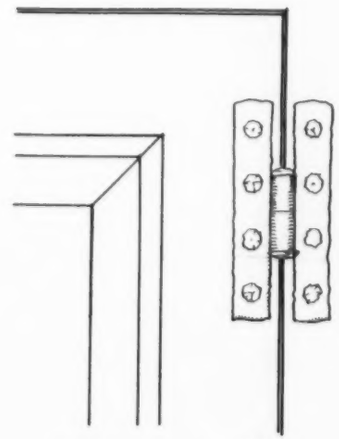
Scale-$\frac{1}{4}$ inch = 1 foot



Hearth



Section A–A



Cupboard Door

WELLINGTON HOUSE

NEAR WALTHAM MASS

EJH

ARCHITECTURAL & BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, *Associate Editor*

The Development of Architectural Practice through Local Co-operation

MUCH has been said and written during the past few years regarding the use of publicity by the architectural profession. Many recommendations have been made, some of a very practical nature, and it would seem to be the consensus of opinion that there is no ethical reason why architects should not advertise. But in spite of this fact there seems to be little activity in this method of promoting practice. It remains, therefore, for constructive suggestion to be made, and to outline one method of activity which should not only assist in developing local practice, but should have the added value of community benefit.

Briefly, we have in mind the possibility of forming local groups of architects co-operating to produce general publicity which will promote in the public mind a better conception of the value of architectural service, both to the individual and to the community.

In traveling through various smaller cities and towns of the East and middle West, particularly in industrial centers, it is amazing to note the lack of architectural merit in the designs of dwellings, small store groups and other smaller types of construction. Naturally, many comments have been made regarding such conditions, but it is also evident in starting new construction that very little progress is being made in impressing owners and communities as to the value of architecture applied not only to the design of individual dwellings, but in relation to unity of mass, which is so lacking even in the newly constructed residential and business sections of our cities and towns.

We may refer for instance, to the great volume of dwelling construction which has been recently carried out in Detroit and other Western cities. In Detroit many millions of dollars have been spent in the construction of so-called duplex houses, which are in reality two-apartment houses. Thousands of buildings of this nature have been constructed in Detroit in the last two years, and the average cost has been from $16,000 to $30,000. Of all these buildings not one-half of one per cent possess any architectural merit. The houses are constructed on narrow lots, the average allowance between houses being simply space wide enough for an automobile driveway. To the fact that land values are high may be attributed the general use of small lots.

Upon inquiry regarding the lack of character, variety and mass unit in these buildings, it was found that very few of the houses were designed by architects,— at least for the type of location in which they were placed. These houses are built usually from stock plans developed by builders, and while they may include every practical comfort for living, they are usually devoid of that attractiveness which is evident in an artistically planned building.

It is a safe estimate that in one year $40,000,000 worth of construction of this type has been carried out in Detroit, in which work architects have received no consideration; nor has the community benefited in proportion to the possibilities. In making inquiry as to real estate values it was found that in certain blocks where houses of good design had been constructed the appearance of the entire block was better and consequently real estate values were higher, as a definite character had been given to that locality.

The development of really good stock plans for homes which has been carried out through various manufacturers' associations and through the activities of certain publications has had beneficial influence on the modest cost domestic architecture of the United States. The fact, however, that a very large percentage of this construction is carried out without the services of good architects is plainly evidenced in a study of new building developments of a residential character.

The same criticism may be made of store blocks, usually two stories in height, containing space for several stores and possibly residential quarters for storekeepers' families. Here and there one may see a new store block which has character and consequently attractiveness. Casual inquiry seems to show that in blocks of this kind store rentals are higher, not because cost of construction is higher, but because atmosphere has been created.

The public at large, and particularly the building public, has no mentor to point out the basic reason why certain houses or certain blocks are more attractive. There is no simple manner through which appreciation in the public mind is being developed regarding the fact that the more attractive units or sections of the community are those which have received architectural study. Consequently, as millions of dollars are being spent in the development of new homes and smaller buildings of various types, there is not an increasing percentage of this work coming under the control of trained designers.

It would seem logical, therefore, that under normal conditions, and particularly in smaller communities, definite co-operation could be carried out among local architects to enter into a campaign

to develop public appreciation of the value of their work,— not only in its value to the individual, but from a community aspect. As we enter the smaller industrial towns where the business section is made up usually of one main artery consisting of one block with offshoots extending into the side streets, we are amazed by the haphazard and unattractive development of these blocks. Here enters not only the question of city planning, but the possibility of an art commission, even in a small town, which, to a certain extent, could control the designing of groups of buildings of a semi-public nature. Certainly much improvement has been developed in residential sections through the medium of restrictions regarding setbacks, sizes of lots, etc., but in the more closely built up sections where real estate values are high, we cannot look to landscape architecture as a means of promoting better design. We must look directly to architecture, particularly in neighborhoods where houses such as the Western duplex houses are in danger of developing into monotonous and unattractive rows.

Through the activities of a committee or group of local architects there is no reason why certain funds should not be raised and expended in developing public appreciation in order that prospective builders of homes and smaller building groups may be induced to at least give consideration to the possibility of using good plans, both from an artistic, community and real estate valuation viewpoint.

Not long ago the directors of the New Jersey Association of Architects were considering a proposition of furnishing plans and designs for inexpensive homes at special and reasonable rates. Other groups of architects have given some consideration to this idea, but in view of the fact that practically every home built from such plans would normally not be planned by an architect, it would seem that co-operation in the preparation of plans would constitute a valuable feature for local application. In fact, this might be a means of publicity.

Suppose a group of local architects were to prepare a number of attractive house plans and offer them to prospective builders in the community at a comparatively low cost. Certainly there would be considerable publicity not only for the architects who entered into such an activity, but for the idea of bettering residential design, and this spirit, once established locally, would result in practical elimination of ugly stock plans and the untrained conceptions of the average builder.

To the lay mind, in considering the construction of an inexpensive home the services of an architect mean added expense. If, however, the architect be of practical mind, he will usually be able to produce a design involving additional features which would more than offset any charge which he might make for the work.

The possibilities of local co-operation among architects for the public benefit as well as the development of their own practice are so great that it is difficult to describe in a brief article the activities which might be undertaken. The home-owning public is always interested in an activity which tends to improve home surroundings or to increase or stabilize real estate values. The speculative builder is ready to be impressed with the value of improved design if some one is willing to undertake his education, and to show him that a well designed house is more saleable. From the viewpoint of community improvements there is no doubt that newspapers would be glad to co-operate in a campaign for the betterment of individual dwelling and community architecture.

Through the activities of such an organized group of architects real estate developers could be induced to avoid common errors in locating dwellings on subdivisions. With a studied campaign of education carried out along simple and dignified lines of community benefit there can be no doubt that a very large percentage of money to be expended for building construction in the community would carry an architect's commission.

In isolated cases some effort has been made in this regard, but as yet there has not come to our attention any well defined local co-operation among architects tending toward the accomplishment of the purposes as outlined here. We are much interested in receiving information from architects regarding the feasibility of the use of publicity in the way indicated.

There is no doubt that the chamber of commerce in the average town would co-operate in activities of this nature. Usually the architect is not a progressive member of the chamber of commerce, even though every other line of effort in the community which depends upon public demand for its support enters actively into co-operation, both for community and individual benefit.

There is no doubt that architects have been somewhat lax in at least one respect,— that is, in waiting for prospective builders to learn, through one manner or another, appreciation of the practical, artistic element in the preparation of building plans, and consequently awaiting calls for their services. In other lines of activity demand for services is definitely developed by some more or less scientific plan of publicity.

No serious obstacle can be foreseen which might preclude co-operative activity of this nature on the part of local architects. The actual division of the work would naturally be left to individual selection, but it is certain that if the demand for architectural services can be increased through the development of public appreciation, there would be more work to go around, and consequently more work for the individual architect who may lend his aid in establishing a better public appreciation of the practical methods of architectural service in the design of dwellings and structures housing business dependent upon the support of local trade.

Applying the Co-operative Method of Financing to Inexpensive Types of Apartment Buildings

As interest in the idea of co-operative apartment house financing is becoming national in its aspect, it is but natural that this interest should take definite form in a consideration of the possibilities of applying the co-operative idea to the financing of moderate cost apartment houses. The great wave of co-operative financing of apartment houses and office buildings which has found its center in New York has, to a certain extent, been developed in high cost buildings; but in view of the number of inquiries in regard to this question, it will undoubtedly interest architects and speculative builders to know that there is no reason why the co-operative method of financing should not be applied to less expensive types of buildings. In fact a number of such buildings have been recently developed in and near New York, and while sufficient time has not yet elapsed to determine the ultimate success of the proposition this method has been successful to the point of making it possible to design a number of buildings.

The basic elements of co-operative building ownership do not preclude the application of this principle to moderate cost buildings, except in the limitation of promoters' fees. In fact it might be said that as the inducement to the promoter is greater in developing high cost buildings it is but natural that real estate activity of this kind should be directed chiefly toward the promotion of the more expensive types of apartment dwellings. Possibly this is why the co-operative plan has been applied, in most instances, to costly developments.

On the other hand, there is a great need of studied application of the co-operative principle in the development of apartment units costing in gross figures not over $8,000 per family. In order to give some idea how a comparatively inexpensive co-operative project can be developed it may be interesting to know of a simple development of this nature which is now being successfully carried out, in so far as the financing is concerned, and which promises to be successful from the tenants' side.

For the development of the operation in question it was first determined that in a rapidly growing industrial city there were a number of families who would be interested in buying an apartment on the co-operative plan provided the cash payment were not too high. It was further learned that as far as a building loan was concerned co-operation might be expected either from a financing corporation, definitely developed to aid in meeting the housing shortage, or from an insurance company which had set aside a certain amount of money to assist in solving the housing problem.

The first step was to work out sketch plans and to outline specifications for an apartment building simple in design and equipped and planned to include every possible economy, but at the same time providing comfortable dwelling quarters for a class of people represented by the employes of local factories. Having determined that the element of financing and demand could be definitely counted upon, the advancing of the necessary equity to carry out this project was undertaken by a group of business men representing employers of labor, and others interested in meeting the local housing shortage.

The general figures on this project were worked out somewhat in this manner:

1 — That a building should be constructed providing ten apartments averaging six rooms each at a cost of $6,500 per family, consequently making the total cost of the building $65,000. The building in question is a four-story, walk-up apartment having simple modern conveniences.

2 — That suitable land for the location of this building should be obtained for $5,000.

3 — That a mortgage loan, bearing an amortization clause as later described, could be obtained, amounting to 60 per cent of the cost of land and building or 60 per cent of $70,000, being a building and first mortgage loan of $42,000, 20 per cent of which was to be paid off over a period of five years. This meant in simple figures that, adding a profit of $500 per family for those who financed the equity in this building, each apartment might be put on the market for purchase at $7,500 made up as:

Pro rata cost of building	$6,500
Pro rata cost of land.....	500
Pro rata allowance for profit	500
	$7,500

Of this amount the advancement of $4,200 as part of the building loan was assured, leaving an actual cost balance of the difference between $7,000 and $4,200, or $2,800 per family, this being the amount of equity advanced by the promoting group.

Having completed the details of the operation thus far a stock company was formed representing the equity in the sales price of the building,— the sales price as given being $75,000; the first mortgage being $42,000, and the original owners having agreed to allow a second mortgage of $15,000 to be paid off on an amortization plan by those who purchased stock carrying occupancy privilege in the building.

From the viewpoint of the buyer, therefore, an apartment in this building could be purchased for the gross price of $7,500 of which $4,200 represented a pro rata share in the first mortgage, and $1,500 represented a pro rata share in the second mortgage, which is to be paid off in five years. Taking this total of $5,700 it is found that the purchaser of an apartment must pay $1,800 in

cash for which he receives one-tenth of the stock of the corporation carrying with it the perpetual leasehold privileges for one apartment. Having paid $1,800 the tenant has assumed these liabilities which might be termed owner's annual rental:

Interest on first mortgage of $4,200 at 6%	$252
Interest on second mortgage of $1,500 at 6%	90
Amortization of 20% of first mortgage over 5 years, or 20% of $840	168
Amortization of second mortgage over 5 years	300
Pro rata cost of maintenance and service charges	300
	$1,110

In this total of $1,110 the items of $168 and $300 representing amortization payments cannot be figured as actual rental, but are actually installments on the purchase of the apartment and consequently represent savings. Therefore the actual rental of the apartments approximates $642 or about $54 a month which is actually decreased by the cessation of interest on the amortization payments until, at the end of five years, the owner of one-tenth of the stock representing the tenancy of one apartment actually pays as a rental charge:

Interest on reduced first mortgage, $3,360 at 6%	$201.60
Second mortgage has been paid off	
Cost of maintenance and service charges	300.00
Owner's rental, after fifth year	$501.60

or approximately $40 per month, to which must be added any repairs which the owner may wish to make to his own apartment, as the owner always assumes interior repairs and decoration in the co-operative plan.

No item is included, of course, on money invested as this interest is returned in the form of reduced rental cost.

In the purchasing of apartments as here outlined the purchaser's viewpoint is that by paying an annual amount, not exceeding normal rental in the locality, he is obtaining the use of an apartment and at the same time buying his share in the building in the same manner that furniture might be purchased on the installment plan.

From the viewpoint of the developers of this project, each is receiving interest on his money and a profit of $500 on a $2,800 five-year interest bearing investment, at the same time helping in the relief of the housing situation.

In later issues we expect to give detailed examples of actual operations where the co-operative idea has been applied to the development of inexpensive types of apartment houses. It is plainly evident that the co-operative apartment of comparatively inexpensive type can be developed for the family which can afford a moderate cash payment, and a low but definite investment each year over a period of years until amortization or indebtedness has been cleared off.

Another method of developing an operation of this type is, of course, getting together a group of future tenants who will do the necessary financing, thus eliminating the middleman who first provides the equity. This requires a larger amount of capital per family for immediate investment, unless it is possible to borrow second mortgage money, paying relatively high fees which may be distributed over the first few years as owner's rental.

In general, however, the successful co-operative developments carried out thus far have included a promoting entity of some sort, which for the sake of profit has either carried out the operation and then sold stock, or has been the actuating force to bring together a group of prospective tenants, receiving a promoter's fee which has been made chargeable to building cost.

A Note of Optimism as to Business Conditions

FROM the viewpoint of increased business for next year, it will be interesting to architects to realize that in the circles of big business there is an increasing spirit of optimism as to future business conditions. This desirable state of mind is supplanting a former condition in which important things seemed to indicate conditions varying from possible acute business panic to the generally accepted belief that we were doomed for at least a short period of depression.

The last two months have been months of readjustment. In many industries labor has been finding itself. According to the monthly review of the Federal Reserve Board for July these interesting conditions bearing upon general business have been thus defined:

"One notable feature of the business situation during the month has been a change in labor conditions. An important factor in this connection has been the development of unemployment in various parts of the country. This unemployment has been apparently chiefly due to three factors. Where poor transportation prevented deliveries of fuel and raw materials some plants have been obliged to curtail operations and thereby reduce opportunities for employment pending better conditions; in other manufacturing districts the shutting down of mills as a result of cancellation of orders and lack of demand has also thrown considerable numbers of men out of work; elsewhere, inability to obtain capital for construction and the consequent abandonment or delay of

undertakings that had been contemplated have produced a certain amount of unemployment.

"An effect of the changed labor situation, which has been the subject of general comment in the various Federal Reserve districts, is an increase in the efficiency of labor. One of the largest producing companies in the Cleveland district reports the greatest four months in our history of pounds produced per man.

"Boston reports that labor is less insistent in its demands and during the first half of July only ten new strikes were reported to the Massachusetts Department of Labor, but two of these involving any considerable number of men. During the latter part of June and the first two weeks of July there was a marked decrease in the demand for factory help. The Boston Public Employment Office reports a surplus of machinists, mechanics and general factory helpers.

"Retrenchment in government manufacturing operations has released some labor. Unskilled labor is also more plentiful than heretofore. In the agricultural regions, however, there is little or no relief from the shortage of farm labor. In the extreme Southern part of the country a better supply of agricultural labor has resulted from the slackening of industrial production.

"In New York there has been a distinct, though not large, increase in unemployment and this is more noticeable than usual at this season in the clothing trades. The labor difficulties at the port of New York have been reduced. Generally speaking, conditions are more stable than they were several months ago. Local shortage of unskilled labor due to the scarcity of immigrant hands is observable.

"A notable event of the month has been the decision of the Railway Wage Adjustment Board, which has resulted in awarding a wage increase to railway workers estimated to aggregate $600,000,000, and presumed to represent an average increase of 21 per cent or over for railway employes as a whole, although the increase granted has been greatest in the lower paid grades of employment.

"Labor in many parts of the country is reported as increasing in efficiency, and a better spirit of co-operation is said to exist between employer and employe."

Another interesting and important prediction is contained in this recent statement made by Judge Gary before sailing for Europe:

"From my viewpoint I think conditions should be considered satisfactory. In some respects I think there has been a lack of prudence in business management since the armistice of 1918. I refer especially to prices. There seems to have been a disposition on the part of large numbers to ask and accept the highest prices which could be obtained. Consequently there has been added to going prices the amount which the producer has been obliged to pay, with profits on the whole, and the purchaser has thus been obliged to charge an increased price to his customers. Besides there have been added many government taxes and other expenses. Therefore, increases in costs of production and consequently in selling prices have been passed on from one to another.

"In addition to this situation the disposition to work and produce has been materially diminished. The workman in the field, at 4 o'clock or some other early hour, drops his tools and leaves the hay or grain unsheltered, to be spoiled or injured by rains during the night, when under old methods it would be stacked or housed before quitting work. This practice has been followed in many different lines of work.

"In order to remove and replace a headlight on a locomotive it has been necessary to employ four different men, because of labor regulations, where one man heretofore performed the service in less time. It has been recently published that the tailors have announced an increase of 15 per cent in selling prices because the workmen advanced their rates 15 per cent. These common illustrations are well known to the average individual. The custom has prevailed of doing as little work as possible and of securing as large a pecuniary result as could be obtained.

"However, somewhat to my surprise, I have, upon inquiry during the last thirty or forty days, ascertained that labor at our various plants is more efficient per man than it has been at any time during the last five years."

The New York *Times* in commenting on an interview with Judge Gary says that in his opinion everyone who has been increasing his profits beyond reason and doing it intentionally has been operating against his own interests. He asserted that if the tailor had borne the additional cost to him resulting from higher wages he would probably have had a reasonable profit left and would have used his influence in keeping prices from advancing further and in restoring a fair equilibrium.

Such inexcusable conditions, in his opinion, have naturally been followed by a diminution in the buying movement. This applies to many different lines, but apparently it has not as yet reached the steel business to a large extent. In calling attention to the disposition on the part of the average man to be more careful in his buying, he gave it as his opinion that this tendency probably would become more and more noticeable throughout the country in the next few months.

In conclusion Judge Gary said: "While I recognize, and for many months have comprehended, dangers in the general situation, I am more optimistic in regard to the future of this country than I have been at any time during the last six years. If people generally will recognize the possible dangers which have been hinted at and will, each for himself or herself, do everything possible and practicable to improve conditions, we shall soon return to a basis of living which should be entirely satisfactory."

EDITORIAL COMMENT

SICK HOUSING CONDITIONS

INTEREST is focusing on the national housing shortage in accelerated degrees as the fall season approaches. While the sick condition of the building industry as far as it relates to housing has been patent to any one who gave the matter a thought, difficulties growing out of hurried, thoughtless legislation, lack of transportation, speculation in materials, and the unwillingness of loaning institutions to extend financial aid have steadily increased till there is now created a situation in which it is impossible to provide a satisfactory house for a family of average income within a cost they can assume.

Shelter is an absolute necessity and it must be provided; if it will not be furnished through the channels to which we are accustomed it will have to be recognized as a duty of State or Federal Government and provided from public funds. This is not in accord with American principles and it should not be made necessary. It would be the most expensive and most inefficient way of meeting the problem.

The solution should be sought in removing from house construction or at least in reducing them, the harassing conditions which have held back building since the armistice. The greatest single difficulty is the lack of money for building loans; others are comparatively incidental and will be lessened with the normal increase in production, but if new money is not made available a deadlock will occur which will have disastrous results for the building industry.

The Associated Metal Lath Manufacturers in a recent bulletin have set forth in detail the reaction on the mortgage market of the Federal Income Tax and recommend most strongly that every one interested in the welfare of building exert his influence in developing a demand that Congress exempt mortgage income from this tax.

The bulletin says: "The banks were obliged to stop construction loans, not because of prices of materials, but because they could not dispose of real estate mortgages to their customers. This was largely due to the Federal Income Tax which, with its heavy Surtax on the larger incomes, makes mortgage buying at 6% absolutely impossible.

"No one can blame the man with an annual income of $50,000 for refusing to make investments that will yield but $412 on $10,000 when he can get $600.

"The bulk of new money for mortgages must come from estates and individuals having such excess funds as are not available until incomes of $20,000 or over are reached. As an example, an income of $30,000 is subject to a Federal Normal and Surtax totalling 21% in addition to the income taxes levied by several of the states. This income tax must be deducted from the gross return on the mortgage before the net return to the investor is found.

"To compete with the 6% Municipal Bond which is exempt from income tax, the banks cannot offer a $30,000 investor anything less than 7.6% on a taxable mortgage, or to the $50,000 investor anything less than 8.7% and have him come out even. With mortgages tax exempt, however, they could readily be sold on a 5% and 6% basis."

It is evident from these figures that the present burden of taxation is a very important factor in holding back construction. Examples of the practical effect of this condition are being brought out in the hearings conducted by the Senate Committee on Reconstruction and Production in various important cities of the country and one of the recommendations which this committee will undoubtedly make will be the exemption of mortgage income from taxation.

As we go to press preliminary meetings are being held in New York to consider the proposals for housing relief that will be presented to the New York State Legislature which convenes in a special session on September 20 to be devoted entirely to housing matters. It is expected that this legislature will exempt mortgages from the State Income Tax and that it will memorialize Congress to adopt similar legislation with reference to the Federal Tax.

There is then a movement started in this direction, but it will need the concerted support of all who are anxious to see our housing difficulties met, if the object is to be realized to a satisfactory degree.

LE BRUN TRAVELING SCHOLARSHIP COMPETITION

THE executive committee of the New York Chapter of The American Institute of Architects, as trustees of the Traveling Scholarship, founded by Pierre L. Le Brun, announces a competition for the selection of a beneficiary, the program of which will be issued about November 1, 1920, calling for drawing to be delivered about January 15, 1921.

The following excerpts from the deed of gift explain the award and conditions:

"Fourteen hundred dollars is to be awarded to some deserving and meritorious architect or architectural draftsman, resident anywhere in the United States, to aid him in paying the expenses of an European trip, lasting not less than six months."

"Any architect or architectural draftsman, a citizen and resident of the United States, not under twenty-three or over thirty years of age, who shall, for at least three years, have been either engaged in active practice, or employed as an architectural draftsman and who is not and has not been the beneficiary of any other traveling scholarship, shall be eligible to compete."

"Every competitor must be nominated by a member of the American Institute of Architects who shall certify in writing that the above conditions are fulfilled, and that in his opinion the competitor is deserving of the Scholarship. No member of the Institute shall nominate more than one (1) candidate."

It is requested that those wishing to enter the competition arrange at once for their nomination by any member of the American Institute of Architects, according to the conditions outlined above, which nomination should be sent with his application so that it may be received before November 1, 1920, to Louis Ayres, 50 East 41st Street, New York City.

HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

VIEW FROM APPROACH

VIEW OF CENTRAL BLOCK

HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

DETAIL VIEW ACROSS FORECOURT

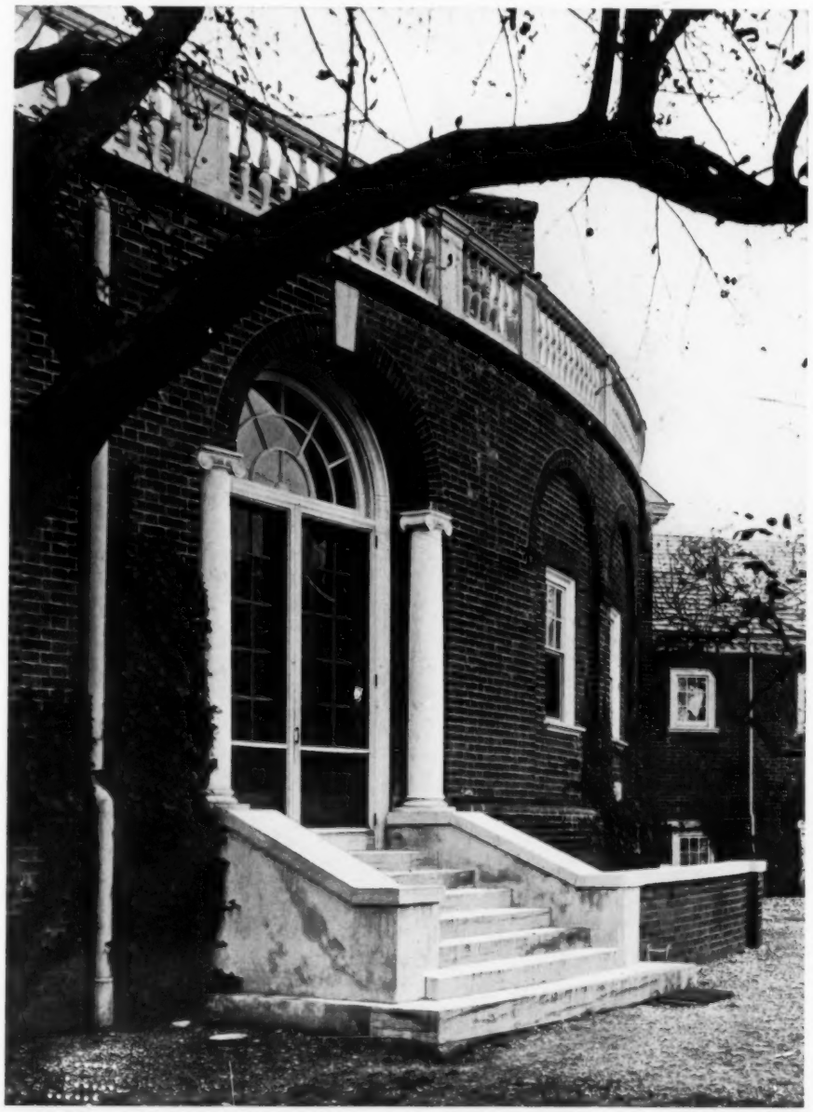
HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

DETAIL OF ENTRANCE

HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS



DETAILS OF SUN ROOM CORRIDOR

HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

LIVING ROOM IN NORTH WING

HOUSE OF LATHROP BROWN, ESQ., ST. JAMES, LONG ISLAND, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

PRINCIPAL FACADE

HAMILTON COUNTY COURTHOUSE, CINCINNATI, OHIO

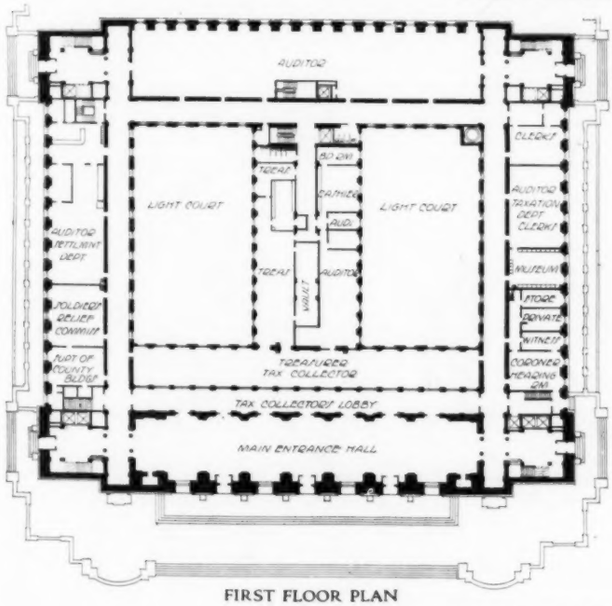
RANKIN, KELLOGG & CRANE, ARCHITECTS

CORNER ENTRANCE PAVILION

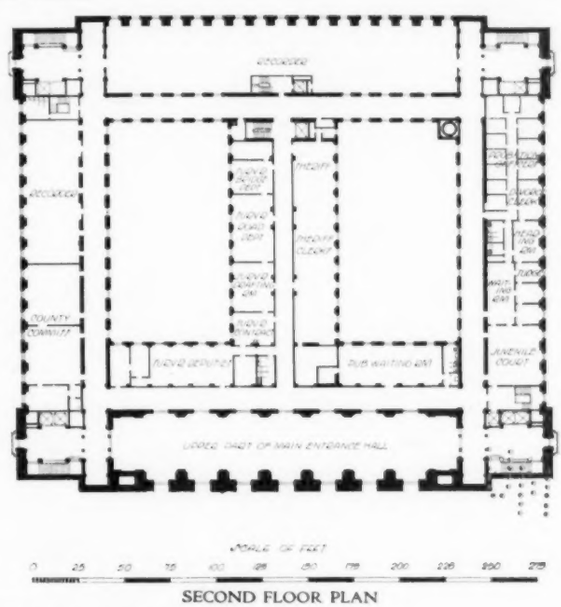
HAMILTON COUNTY COURTHOUSE, CINCINNATI, OHIO

RANKIN, KELLOGG & CRANE, ARCHITECTS

DETAIL OF PRINCIPAL FACADE



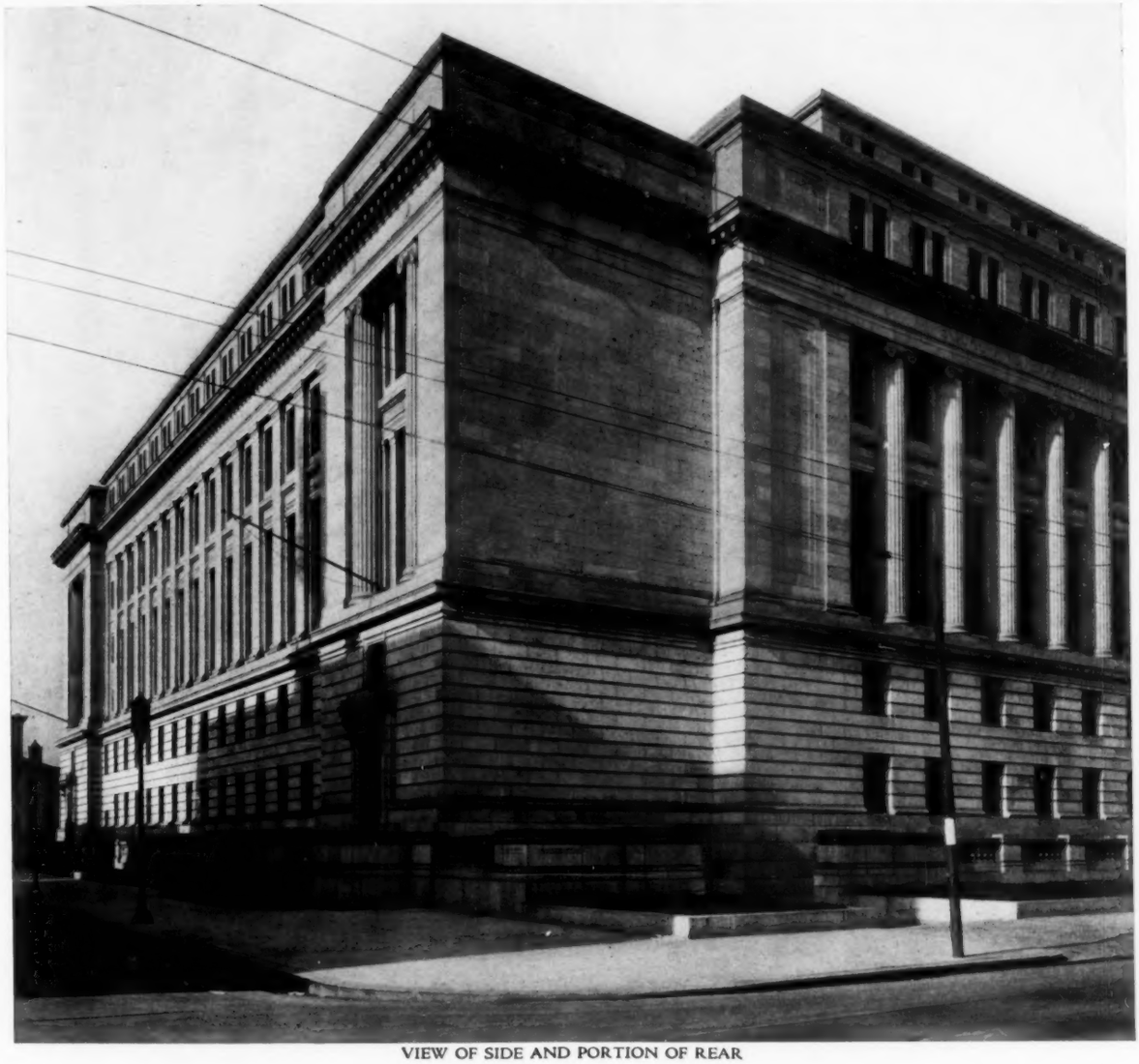
FIRST FLOOR PLAN



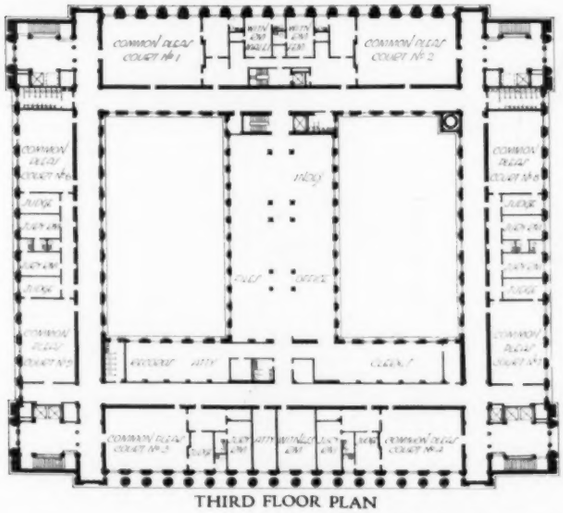
SECOND FLOOR PLAN

HAMILTON COUNTY COURTHOUSE, CINCINNATI, OHIO

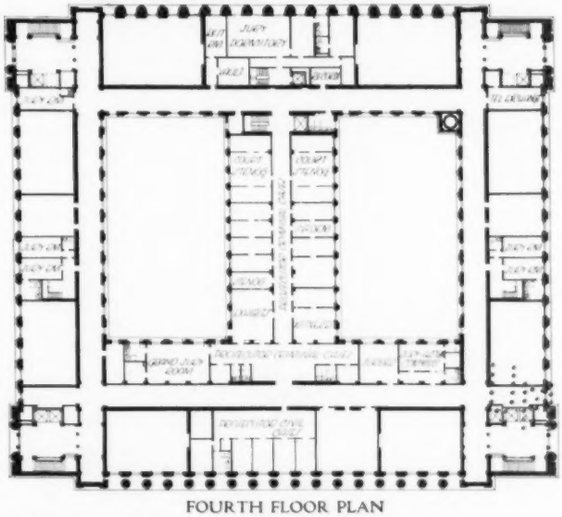
RANKIN, KELLOGG & CRANE, ARCHITECTS



VIEW OF SIDE AND PORTION OF REAR


COMMON PLEAS COURT No 1
COMMON PLEAS COURT No 2
COMMON PLEAS COURT No 3
COMMON PLEAS COURT No 4
COMMON PLEAS COURT No 5
COMMON PLEAS COURT No 6
HALL
CLERK

THIRD FLOOR PLAN

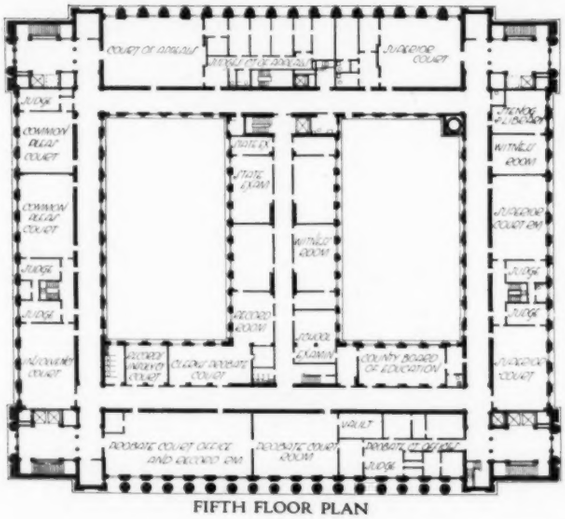


FOURTH FLOOR PLAN

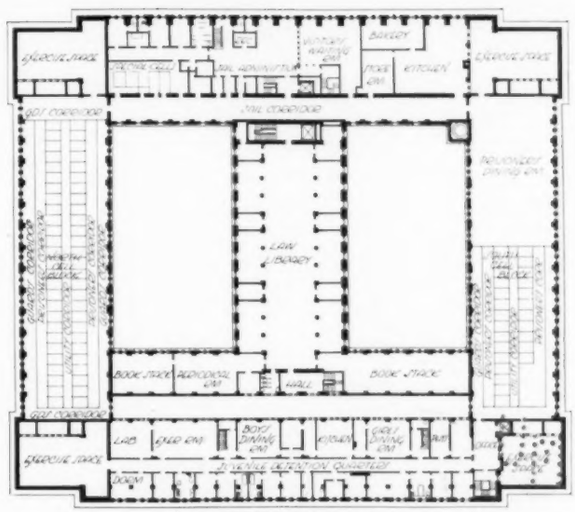
HAMILTON COUNTY COURTHOUSE, CINCINNATI, OHIO

RANKIN, KELLOGG & CRANE, ARCHITECTS

TYPICAL COURT ROOM



FIFTH FLOOR PLAN



SIXTH FLOOR PLAN

HAMILTON COUNTY COURTHOUSE, CINCINNATI, OHIO

RANKIN, KELLOGG & CRANE, ARCHITECTS

MAIN ENTRANCE HALL

LAW LIBRARY

HAMILTON COUNTY COURTHOUSE, CINCINNATI, OHIO

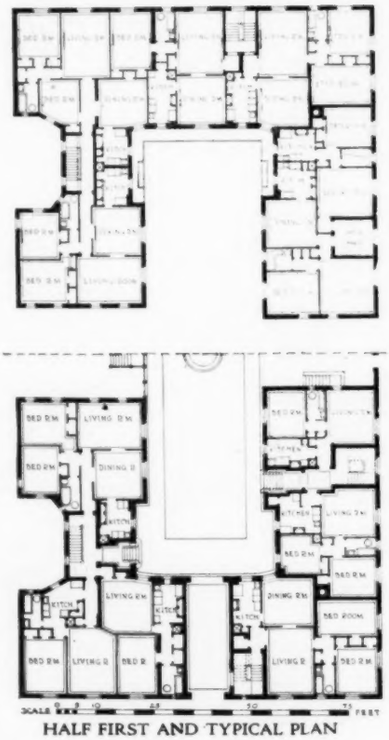
RANKIN, KELLOGG & CRANE, ARCHITECTS

DETAILS OF LAW LIBRARY AND ENTRANCE HALL

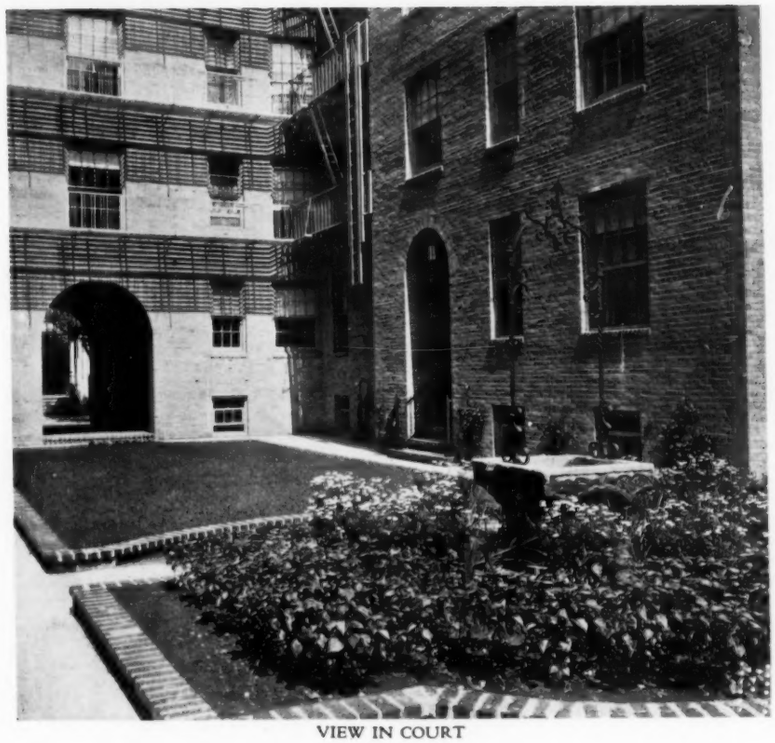
HAMILTON COUNTY COURTHOUSE, CINCINNATI, OHIO

RANKIN, KELLOGG & CRANE, ARCHITECTS

VIEW FROM CONCOURSE



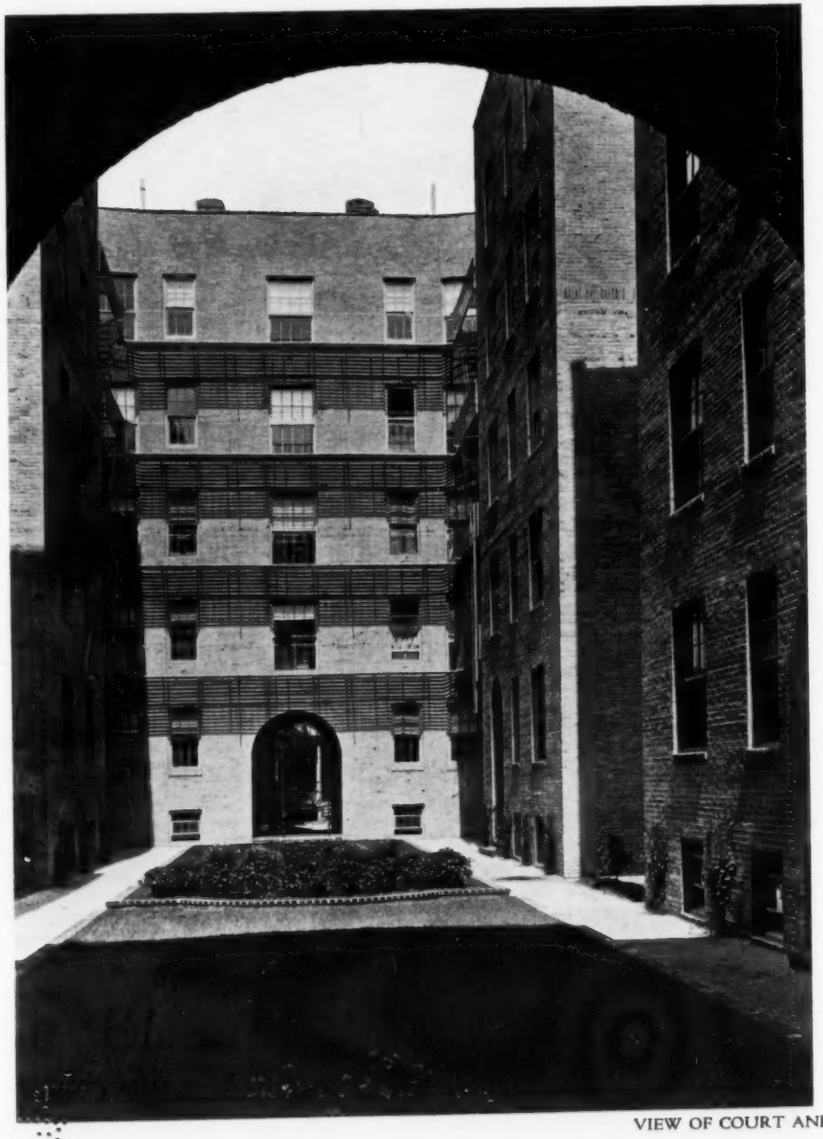
HALF FIRST AND TYPICAL PLAN

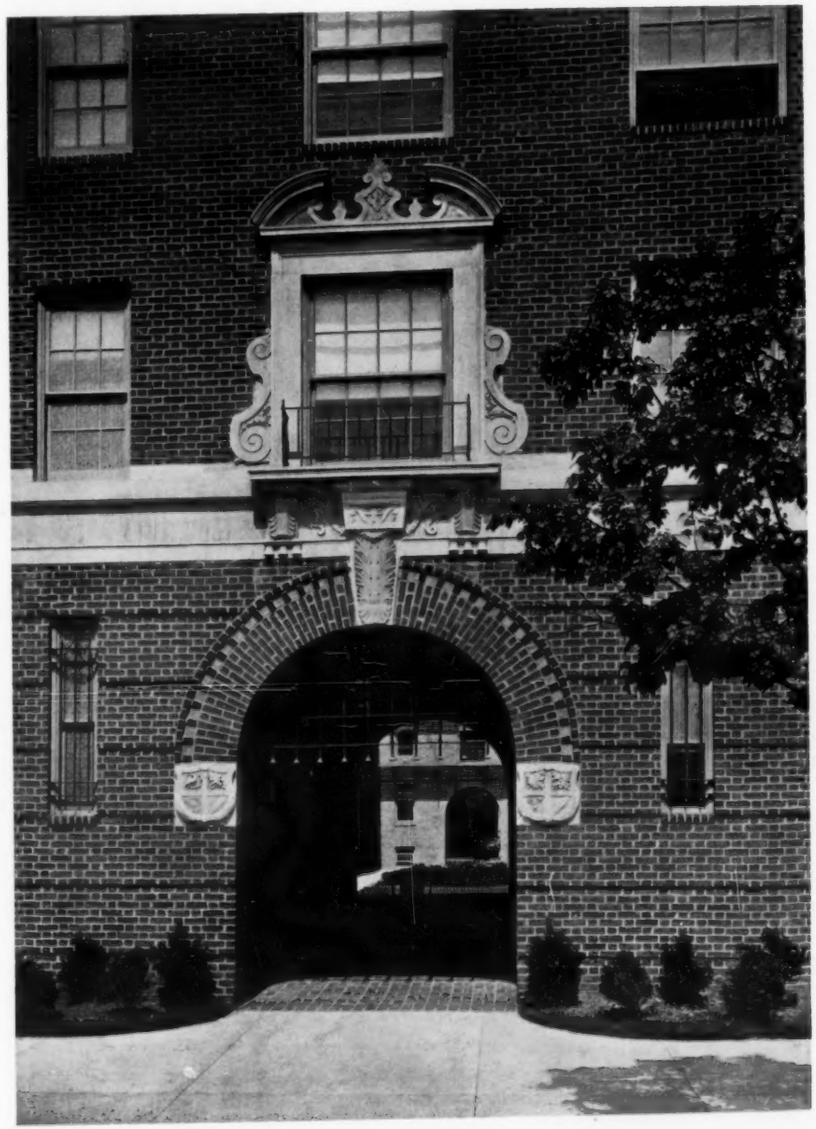


VIEW IN COURT

APARTMENT HOUSE, CONCOURSE AND 183D STREET, BRONX, NEW YORK

ANDREW J. THOMAS, ARCHITECT

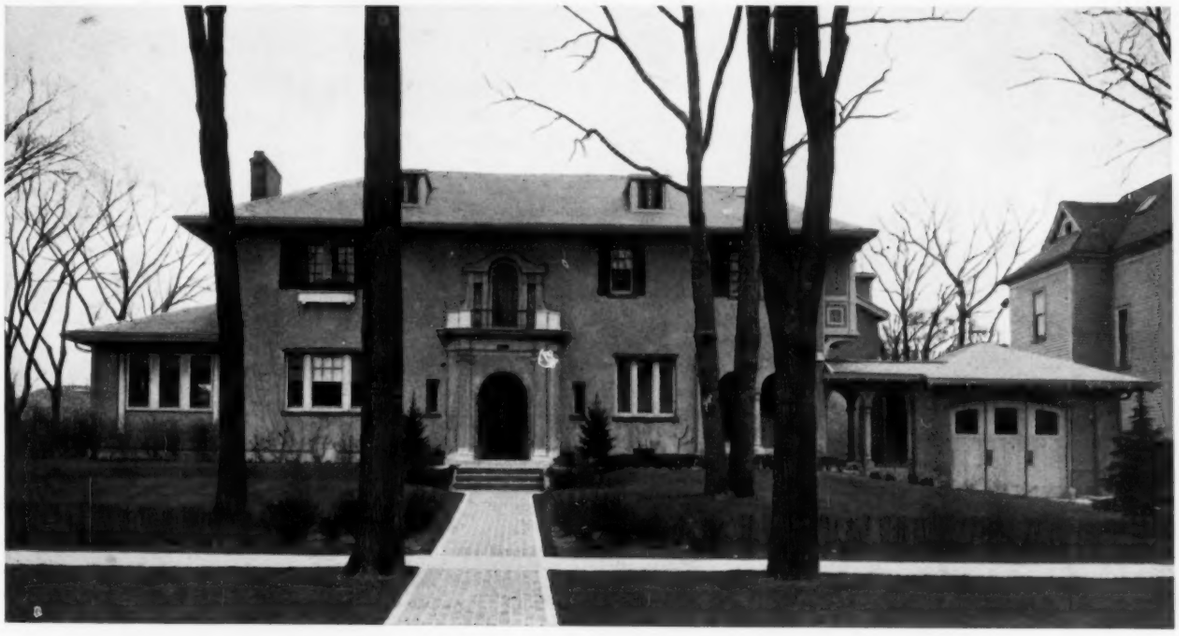


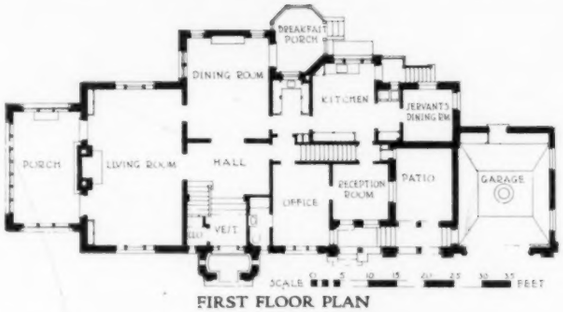


VIEW OF COURT AND DETAIL OF ENTRANCE

APARTMENT HOUSE, CONCOURSE AND 183D STREET, BRONX, NEW YORK

ANDREW J. THOMAS, ARCHITECT





FIRST FLOOR PLAN

SECOND FLOOR PLAN

HOUSE OF DR. W. R. PARKS, EVANSTON, ILL.

TALLMADGE & WATSON, ARCHITECTS